AN INVESTIGATION INTO THE SURVIVAL OF MEDIEVAL PLASTER IN DORSET CHURCHES

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An investigation into the survival of medieval plaster in Dorset churches.

by

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Abstract

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Title of Thesis : An investigation into the survival of medieval plaster in Dorset churches.

It is a widely held view that most internal church decoration, including plaster, was removed as part of the unprecedented campaign of restoration undertaken by the Church of England during the second half of the nineteenth century. The thesis seeks to test this view by quantifying the extent of medieval plaster surviving in Dorset churches, and setting this survival in an appropriate historical, technical and cultural context. Literature relating to church plaster on both a national and local level has been reviewed and correlated with the results of the survey and also used to explore cultural reasons for the destruction of medieval plaster.

The survey has proved that there is a substantial survival of medieval plaster in Dorset churches. To date this survival has gone severely under-recorded, even in specialist literature. Perhaps the most significant finding of the survey has been the scale on which Victorian restorers have covered historic plaster with their own, rather than stripping the old and starting again from a bare substrate. Whilst this discovery has been a major success for the project, it has simultaneously highlighted the greatest weakness of the project. Since the survey is based solely on external visual examination, it has been unable to reliably estimate how much old plaster survives below Victorian overskim, only that there is peripheral evidence of its survival. Non-destructive testing systems that might overcome this problem are investigated and the results of trials reported. Techniques for improving the objectivity of visual survey are also reviewed

Survey data is analysed to determine if the probability of plaster survival can be predicted by factors such as location, date of restoration or architects involved.

Contents

Note on the structure of this thesis.

Though not formally divided into sections, this dissertation does naturally fall into three groups of chapters.

By far the most important group of chapters, the core of the contribution made by the thesis are those that deal with the survey, its results and the analysis of those results. (Chapters 7 and 8).

These core chapters are supported by introductory material on the aims, objectives, general methodology and the literary material used in support of the primary research. (Chapters 1, 2 and 3). Further contextual support for the core of the thesis is provided by chapters 4, 5 and 6, which respectively examine the nature of plaster as a material, how historic plaster can be defined and why historic plaster is important.

The final informal chapter group contains discussion of the ways the survey technique could be developed and improved (chapters 9 and 10) and reviews the whole project with chapter 11.

Chapters 13 and 14 provide supporting reference material required by the rest of the thesis, and are not designed to be read on a narrative basis. Though chapter 15 (on CD) also contains supporting material, the photographic evidence section is designed so that it can be used independently from the rest of the thesis (though the reader is not encouraged to do so).

Chapter 10. Ultrasound Applied - page 191

Building on the general discussion of non-destructive survey strategies in chapter 9, this chapter illustrates and discusses the potential for further work using ultra-sound to find overskimmed layers of early plaster.

Chapter 11. Conclusions - page 199

This chapter summarises the project and suggests opportunities for further research.

Chapter 12. Illustrations, maps and tables - page 207

Illustrations, Tables and Maps on attached CD
To allow better reproduction and to save space, all illustration, tables and maps are included on the CD attached to this thesis:

All illustrations, tables and maps are separately indexed on the CD. This index is reproduced here.

Chapter 13. References, Bibliography, Biographical notes and Glossary - page 279
Standard bibliographic references in support of citations in the text, together with biographical notes on persons mentioned in the text or cited as have having provided personal communications.

Chapter 15. Material on CD.

The maps and tables found in chapter 15 are also presented on CD, which allows substantially better graphic presentation.
Additional photographs, supplementing those in the text are are presented on the CD.

The CD has its own self contained index and link system.

Illustrations and figures in the text

Except where otherwise noted, all the illustrations and figures are the original work of the author.

Authors' declaration

At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award without the prior agreement of the Graduate Committee.

This study was financed entirely by the author except for the provision of sonar equipment by Plymouth University.

This thesis is solely the individual contribution of the author. The field research was, however, greatly assisted by many friends, family and students, all under the direction of the author. The role of many professionals in providing data by personal communication is also gratefully acknowledged.

No formal additional educational study was undertaken as part of this project.

No relevant scientific seminars or conferences were attended as part of this study, since none occurred during the study period. No external institutions were visited for consultation purposes, though a wide range of professionals working in the field were consulted. This consultation forms a major part of the research effort of the thesis.

No publications have yet arisen as a result of this work.

External contacts made as a result of this research are too numerous to list here. They are noted, where relevant, in the text and explained further in *chapter 13.4 : Personal communications : Biographical notes* section of the bibliography.

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To Linda Watson and Dick Griffiths of Plymouth University, who as tutors, were endlessly patient, supportive and encouraging, and to all those others who helped, a thank you, whose brevity belies sincerity.

1. Preface

The origins of this project extend back many years, and some of its idiosyncrasies can only be explained by recounting its origins.

Working as an archaeologist in the nineteen seventies, the author was contracted to strip areas of plaster from the interior walls of Ubbeston church in Suffolk. The aim of the work was to reveal pre-Norman stonework features. It did not occur to anyone involved that there might be any intrinsic value in the plaster that was destroyed. *(see chapter 6 for a discussion of the importance of historic plaster)*. It was simply in the way of archaeological knowledge gathering. It is possible that some small seed of ethical doubt was sown at the time, but it was not until the author trained as a stone conservator at Wells Cathedral that the potential for plaster stripping to cause artistic damage really became apparent.

Some years later, and now working as a building conservation contractor, the author developed friendships with John Schofield (an architectural poet of building conservation) and David Dawson (a man for all seasons). Together with these wise and subtle men, and half a dozen others, an informal group was formed to study the surviving medieval features of Somerset churches. Some 150 were informally, and rather chaotically, surveyed. The results remain unpublished, but many discoveries were made. Most notably, it became obvious that Victorian restorers were often not as thorough as has been understood from documentary sources. It was observed that substantial quantities of internal wall plaster appeared to be pre-nineteenth century, even where the church had been extensively restored.

Perhaps more importantly for this thesis, the *Somerset churches survey* was a period of very intense education for this author. The discussion and discovery that took place, together with the experience gained by 15 years of conservation contracting, has given this author a very substantial knowledge base covering all aspects of historic building. This knowledge base has been further deepened and extended by active involvement with the *Society for the Protection of Ancient Buildings,* the *Building Limes Forum* and the *Association for Studies in the Conservation of Historic Buildings.*

This background of intensive professional education has been essential to the creation of this thesis. However, it has also caused considerable difficulties. Much of the knowledge that informs this thesis has been gained by personal communication with a very extensive network of architects, surveyors, churchmen and women, historians and heritage administrators, and it has sometimes proved difficult to fit this knowledge into the standard format of a doctoral thesis. The author does not apologise for this. If this thesis has merit, it is largely because it has been written by a 55 year old with exceptional experience in building conservation, and not by a 23 year old who has yet to set foot outside university.

The chief practical outcome of using experiential knowledge within the thesis is that there are more *pers.com* citations than is usual. In order to make these as meaningful as possible, brief biographical details of every *pers.com* source are included after the bibliography. *(chapter 13.4)*

With the passing of further years, the author moved to Dorset and became a university lecturer. Casual visits to several Dorset churches revealed that unexpected plaster survival was not just a Somerset phenomenon. This realisation sparked the idea that a formal survey could form the basis of doctoral thesis. With considerable encouragement and help from friends and from staff at Plymouth, the thesis has become a reality.

2. Introduction to the project.

2.1 Characterising early plaster.

The ideal way to start any discussion of early plaster is celebrate its visual qualities. The following photographs not only define and characterise early plaster, they set the mood for the whole thesis. The survival of early plaster is academically interesting, but the plaster surfaces themselves are more than this : they are both interesting and beautiful.

Figure 1

Abbotsbury.
East end of the north aisle.

Very strong oblique sunlight highlights the surface texture of medieval plaster ; it is smooth but wavy.

Figure 2

Tarrant Crawford.
Nave north wall.

Here a painted surface is smooth, as at Abbotsbury (above), and though much less wavy, is still not ruled flat in the way that is typical of nineteenth century plasters.

Figure 3
Inglesham, Wiltshire.
Flatter, less wavy, plaster was probably demanded by wall painters when they were drawing with very fine and delicate line, as here at Inglesham in Wiltshire.

Figure 4
Kempley, Gloucestershire.
However, finely drawn paintings were also placed onto very wavy plaster, as here on the north wall of the nave.

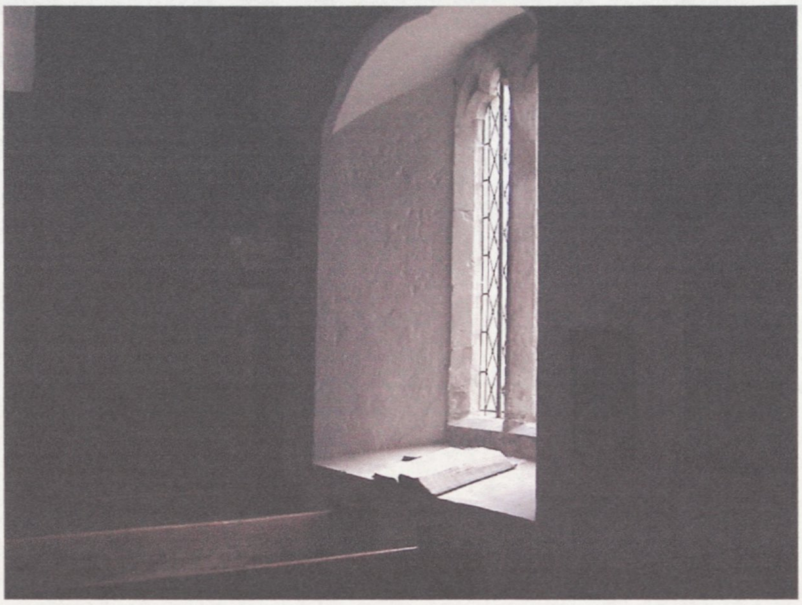


Figure 5
Cranborne.
Towards the west end of the north aisle.
Early plaster on the window reveals. The waviness is quite hard to see because the plaster is carrying many layers of limewash and the lighting conditions are quite poor. Poor light was one of the chief difficulties faced by the survey

Figure 6
Loders.
West end of the nave.
Here paint has been applied to very wavy plaster, but the chief interest lies in the random exposure of the painted surface. There is every reason to suppose that the exposed area does not represent the full extent of paint and plaster survival, and less well preserved areas are likely to be overskimmed by the surrounding plaster.

Figure 7
Litton Cheyney, north wall of the chancel.
Overskim. One of the main finding of the project has been that Victorian restorers often covered existing plaster layers with new plaster, rather than hacking off existing plaster and working from a clean substrate. Here is clear evidence of this phenomenon of over-skimming.

Figure 8
Puncknowle, east end of the north arcade.
The thick layer of yellow painted plaster is typical of the nineteenth century overskim plasters that are likely to hiding considerable areas of early plaster.

2. Introduction to the project.

2.2 Introduction

This thesis concerns the survival of church plaster. It also attempts to define the importance of plaster as a part of the wider field of church art. To place the study of plaster in a meaningful context, it is necessary to give at least a brief overview of what medieval church art was like. This is no easy task. We have very little left from the medieval period, and what we do have is often very difficult to recognise and interpret. This chapter attempts to provide a context for the later discussions on the nature of plaster and its cultural significance.

2.3 The history of church plaster

Religious faith was a key part of medieval life in Europe. Every aspect of existence was influenced, if not dominated, by the church. *(Bettey, J.H., 1989, chapter 1., Green, V.H.H., 1964. chapter 1.)* In England, all levels of society accepted that the path to salvation lay through dutiful worship at the altars of the Roman Catholic church. An integral part of this faith – its material expression – was the creation and decoration of church buildings. The creation of a large and richly decorated church was, in itself, an act of piety for medieval clerics. *(Cocke, T., 1995, pp.11-29)*

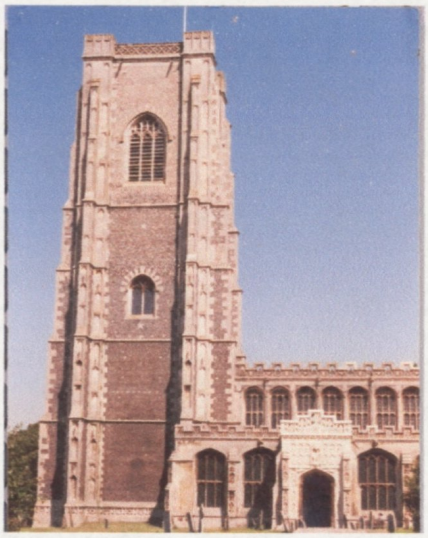


Figure 9
Lavenham church, Suffolk : constructed to the glory of God without regard to utility or cost.

This decoration took many forms apart from large and expensive structures. Churches became filled with expensive furniture and decoration. This included :

i Plate, including candlesticks, and the bowls and chalices used for the communion service. These items were (and are) often exceptionally beautiful and valuable. This project has noted that both Pevsner and the Royal Commission on Historical Monuments (RCHM) appear to be much more interested in these trinkets than in medieval plaster.

ii Textiles such as altar hangings and priests' robes. Late Saxon itinerant preachers may have been humble and modest, but medieval clergy dressed in considerable style. The priests' own decoration, by way of stoles, chasubles and copes was often conspicuous and flamboyant. In this respect, it was well matched to the painted and carved decoration of the whole church interior.

iii Stained glass. Now that most of it is lost, destroyed in the later stages of the Reformation, it is hard to imagine how church interiors must have looked on sunny days with colour light playing on painted walls ! *(Crewe, S., 1987, passim)*

Figure 10
Trent, Dorset. Mosaic of medieval glass recovered from Reformation destruction.

iv Lighting. Few details survive of medieval church lighting other than occasional cresset stones (such as at Pilsdon and at Hillfield), and altar candle holders. By the seventeen century , very elaborate corona lucis fittings had become fairly common, though most have been lost during the changes to gas and electric lighting.

Figure 11
Twyning, Gloucestershire. 17th century *corona lucis*. Post Reformation but likely to be part of a continuing medieval tradition.

v Stone and wood carving and sculpture. Some would argue that stained glass was the greatest achievement of English church art before the Reformation *(Channer, J., 1985, pers.com),* but not every one would agree. The very early (probably Saxon) carved fragments shown here give a small hint of the power of the masons art. The carved oak bench ends, screen, and decorated roof trusses of late medieval church are also justly

Figure 12
Winterbourne Steepleton, Dorset. Saxon angel moved from outside the church into the chancel in the nineteen-nineties.

Figure 13
Loders church, Dorset. Saxon carving.

Figure 14
Old Dilton, Wiltshire.
seventeenth century box pew interior. A poor hint of the lavish resource put into timber furnishing before the Reformation

vi Painted decoration of all surfaces. Until the Reformation only the most exotic building materials were deemed to be worthy of display in their own right. Wherever a parish could afford it, every surface would have painted or gilded decoration *(Schofield, J., 1983-1993, pers.coms, Bucknall, J., 1984-1993, pers.coms, Hadlington, M., 1986-1993, pers.coms, Park, D., 1999, Rouse, C.E., 1968.)*

Figure 15
Pilton Church, Somerset.
fifteenth century carved, gilded and painted wood details from the rood screen.

(original photo by Liz Cheadle)

vii Plaster. It is generally recognised that medieval English churches were almost always plastered internally to provide a surface that could be decorated with paint. *(Rouse, C.E., 1968, p.3)*

At Glastonbury Abbey Lady Chapel the contrast between the painted past and the austerity of the post-Reformation style of church decoration is highlighted by the juxtaposition of ruin and reconstruction :

Figure 16: Glastonbury Abbey Lady Chapel today

Figure 17 : Glastonbury Abbey Lady Chapel as it probably looked at the end of the fourteenth century, when fully plastered and painted. Evidence for the reconstruction is based on observation of paint traces on site, together with comparison with paint schemes at Wells and Exeter Cathedrals, by Warwick Rodwell, Jeremy Sampson and Eddie Sinclair. *(From an original painting by Lizzie Induni.)*

Use of plaster in the medieval scheme of decorative glory is less obvious than painting or carving. It has, literally, a supporting role, but it is an integral part of the painted decoration applied to most wall surfaces. Most medieval church masonry was too rough and irregular to allow direct application of paint to wall surfaces. *(See chapter 7.5.2.3.) (Rouse, C.E., 1968, p.9, Schofield, J., pers.coms. 1984 on, Bucknall, J., pers.coms. 1985 on)*

Pre-Reformation plaster was technically and aesthetically very different from the plasters of more modern times. These differences are crucial to the proposition that underlies this research, and are discussed in detail in chapters 4, 5 and 7. Differences in the structure and surface finish of old plasters allow them to be differentiated from more recent layers. *(See chapters 4 and 5.)* Medieval plaster was usually smoothly finished, but it was rarely flat *(Cennini, d'A.C., 1960, p.42)* (The development of ruled flat surfaces started to become fashionable in secular buildings during the 18th century, under the influence of Palladio and Robert Adam, and was part of the general growth of interest in classical architecture). *(Bucknall, J., 2001-2, pers.coms.)*

Unrestored medieval church walls have a characteristically wavy surface. At its most pronounced, this wavy surface is easy to recognise. *(See chapters 5 and 7.)* Sadly the waviness is often subtle and elusive, even with an experienced eye. *(Again, see chapters 5 and 7.)* It is also very hard to describe objectively. Despite the trials described in *chapter 7*, this project has had to rely on the experienced eye of the author to compile the survey.

If plaster and painted decoration were almost universal, where are they now? The casual visitor to parish churches often comes away, not with an image of plaster and paint but of neatly pointed exposed stonework. Victorian restoration is said *(Chatfield, M., 1989, passim., Schofield, J., pers.coms., 1987 onwards.)* to have removed most early plaster by :

i rebuilding whole walls, and thus incidentally destroying plaster,

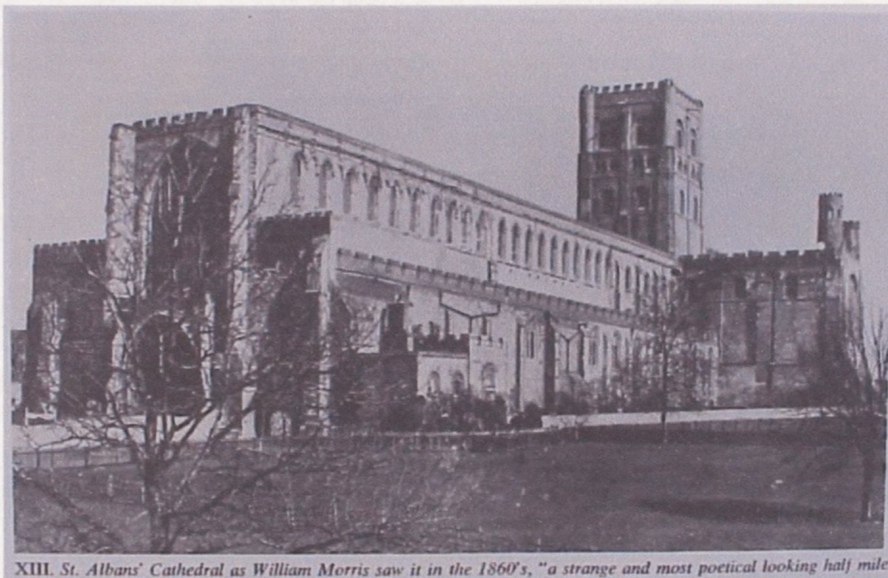
ii stripping the old plaster deliberately in order to replace it with fresh plaster of better quality,

iii or stripping the old plaster to deliberately reveal the underlying masonry.

The common wisdom among church historians, architects and the church itself has been that the Victorian restorers were universally thorough. *(Pevsner, N., 1972, passim., Clifton-Taylor, A., 1986, chapter 1., RCHM, 1952-75, passim., Burman, P., c.1989, pers.com., Sampson, J., 1985-1995, pers.coms., Rodwell, W., c.1985, pers.com., Baker, R., 1984, pers. com.)* To fully understand how thorough their work really was, it is necessary to understand the Victorian attitude to historic buildings. This is discussed below and in chapter 14.6 Victorian attitudes to plaster were part of the wider nineteenth century debate on repair versus restoration. Scrape versus anti-scrape was a fiercely polarised argument and tended to cast either camp as absolute destroyers in the minds of their opponents.

Figure 18
The case of St Albans Abbey nicely illustrates the polarity of the restoration versus repair debate. Before restoration at the end of the nineteenth century, the abbey was not beautiful, but it was genuine.

(Source : uncertain, believed to be from an unknown book in the collection of Sonia Rolt.)



XIII. *St. Albans' Cathedral as William Morris saw it in the 1860's, "a strange and most poetical looking half mile of a church."*

Figure 19
St. Albans Abbey, before restoration. Detail of west end.

(Source : Original glass slide by unknown photographer in the Society for the Protection of Ancient Buildings (SPAB) collection)

Figure 20
St. Albans Abbey, after restoration. Restorers saw it as a triumph... meaning and beauty put back where decay and poor repair had removed the spirit of the original design.

Repairers counter with the cry, very pretty, but where was the evidence for what you have done, and where has the old building gone?

The debate is still very much alive.

(Source : SPAB collection, as above)

This polarised view has persisted. It is very tempting to view a specific architect as belonging to the repair camp or the restoration camp and thus to expect all his output to reflect only that philosophy. Reality appears to have been more complex. The results of this research suggest that there is a connection between the amount of plaster surviving and the architect involved, but that it is not a straightforward one.

In the context of this project, serious non-philosophical issues are obscured by the heat of the repair versus restoration debate, including :

i How often did the Victorians remove existing plaster when they made structural changes?

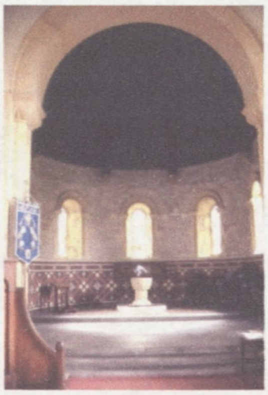
ii Is there any evidence that Victorian restorers were always as thorough as we have assumed they were ? Victorian attitudes to quality of work were certainly very variable in the world of industry. *(Hobsbawm, E., 1969, chapter 4.)*

iii How often did the Victorians save money and time by plastering over existing decoration? To what extent is older plaster covered over or overskimmed by Victorian plaster ?

The following images well illustrate the difficulty of remaining aloof from the passionate side of the repair versus restoration debate. These three are examples of a genre where what is actually done is lost in the heat of the argument over the ethics of the doing of it:

Figure 21
Glastonbury Abbey, Somerset.
The honesty of the carved capitals - left as blank rough-outs - the lack of any attempt to restore historic detail - shows the influence of SPAB on the restoration versus repair debate.

Figure 22
Hooke, Dorset. A favourite pastime for restorers : filling old niches with new sculpture.



Figures 23 (above) and 24 (below)
Melplash, Dorset. The furthest extreme of nineteenth century restoration, in Dorset. A giant creation by Benjamin Ferry in 1845-6 which completely obliterated the medieval church. No plaster of any sort now remains. The nave is now converted into a squash court. Perhaps a fitting indignity for such a pompous act of vandalism. Arguably, no other church in Dorset better illustrates how Victorian wealth, guilt and arrogance swept away medieval plaster in Dorset.

The issue is not whether it is, or is not, a fine building. The issue is where is the old one ?

Despite the evidence presented by Melplash, it is far from certain that Victorian restorers were normally as thorough as Ferrey. How often did they reface existing structure rather than fully demolishing it? The evidence gathered by this project suggests that full demolition was relatively rare.

This project has not been able to discover any previous systematic survey of Victorian plaster to see if it has been applied on top of earlier plaster. There does not appear to have been any national survey of wall paintings since that by Keyser in 1883. *(Rouse, C.E., 1968, passim., Burman P., 1985, pers.com., Baker, R., 1985, pers.com.)* This a very great shame since the recording of medieval wall paintings automatically means the recording of medieval plaster.

This project has addressed this lack of survey data and demonstrated that more medieval plaster survives that has been hitherto assumed in Dorset.

It is possible that the data generated by this project will have wider implications for the rest of England, but any attempts to generalise must be done cautiously *(see chapter 7)*. In particular, the project has not sought to analyse whether any historical factors unique to Dorset may skew the interpretation of the survey in a national context.

3. Aims, objectives and methodology

3.1 Introduction.

This chapter has these elements :

i To establish the aims and objectives of the project

ii To give an overview and justification of the methodology adopted for the research

iii To review the literary sources used.

Details of the methodology for the field survey are discussed in *chapter 7.*

The limitations and weaknesses of the thesis as a whole (scope for further research) are discussed where relevant, summarised at the end of this chapter and reviewed in *chapter 11 : Conclusions.*

3.2 Aims and objectives of the project

3.2.1 The three aims of the project were :

i To discover the extent of medieval plaster survival in Dorset churches.

ii To establish a reliable, objective and *practical* method of survey for locating medieval church plaster.

iii To establish, by analysis of the survey data, whether any factors exist that allow the prediction of plaster survival.

3.2.2 Objectives

In order to achieve the above aims, the following five objectives were pursued :

i To gather primary data on plaster survival by means of a visual survey of a comprehensive random sample of the churches in Dorset.

ii To analyse the data gathered by field survey and correlate the results with data from other sources, such Pevsner *(Pevsner, N, 1972)*, The Royal Commission on Historical Monuments (*RCHM, vols.1 to 5, 1952 to 1975)*, and Hutchins, *(facsimile*

3rd Ed., 1973) together with a wide range of other commentators, as discussed in the literature review (below).

iii To test and analyse the utility of documentary sources in indicating the likely survival of ancient plaster.

iv To test the survey data against a range of hypotheses to determine whether it is possible to predict the likelihood of plaster survival without recourse to field survey.

v To explore and analyse the weaknesses inherent in a visual approach to survey of plaster survival and to explore practical and affordable techniques for improving the objectivity and utility of the survey process.

3.3 Methodology

3.3.1 Choice of area for survey.

Dorset has been chosen as the focus of the project for several reasons :

i Practical ease of access for the author.

ii Compact geographic size of the county.

iii Relatively modest scale and complexity of most of the churches.

iv Generally good accessibility to church interiors, with few being normally locked.

v Initial research in the Dorset Local Studies library, involving the *Dorset County Chronicle, 1840 on., the Dorset Natural History and Archaeology Society, Proceedings, 1870 on., and Draper, J., 1999 on, pers.coms., Thomas, J., 2001, pers.com.)* suggested that Victorian restoration had been very wide ranging and thorough so that the number of churches needing detailed investigation would be quite small.

3.3.2 Choice of churches for survey.

It had been originally anticipated that the sample would include all the medieval churches in Dorset. This idea was modified as the following difficulties became apparent :

3.3.3 Difficulty with the definition of Dorset.

Extensive boundary changes have occurred, particularly along the eastern boundary with Hampshire. These make the correlation of published data sets very difficult. To minimise the problem the definition of Dorset used by Pevsner *(Pevsner, N., 1972., passim.)* has been adopted with the consequence that all the churches in Bournemouth, Christchurch and the Avon valley have been excluded from the survey.

3.3.4 Problems with access to churches in urban areas.

Finding key-holders for, and gaining access to, locked urban churches proved disproportionately time consuming, and was abandoned. Thus, churches in Weymouth, Blandford and Poole were completely excluded from the survey. Churches in Dorchester, Sherborne, Shaftesbury are not all included.

3.3.5 Unreliability of construction date information.

Some churches were described in documentary sources as being entirely Post Reformation in construction date. *(Pevsner, N., 1972., RCHM, 1952-70., Hutchins, J., 1973(Ed.), Victoria County History : Dorset, 1968(Ed.), Morshead, O, unpublished notebooks, passim., Pitfield, F., 1981, passim.)* Sample checks proved this information to be less than completely reliable, so all Dorset churches were externally visited to corroborate the documentary evidence. Where the documentary sources were found to correctly assert that no medieval fabric existed, the church was excluded from the survey data regardless of its physical location.

3.3.6 Sample size

Considerable thought was devoted to achieving a satisfactory compromise between the number of churches surveyed, and the cost and time involved, and a decision made to attempt a survey of all the churches not excluded by the above criteria.

3.3.7 Statistical and experimental validity.

It would be satisfying to claim that the findings of this survey have statistical validity and could be used to build a general picture of wider national trends in plaster survival. However, this is not the case. Although the data gathered by this survey is extensive, with over 200 churches surveyed, no work has been done to test whether the churches surveyed are typical of churches nationally. Indeed, it is very doubtful that the churches of any one county in England can be said to closely resemble those of any other. It is true that many of the influences *(see below and chapter 8)* shaping the pattern of plaster loss and survival are national rather than county specific. For example, Henry VIII's Reformation was nationally implemented. However even a process like this, strongly centrally dictated and administered, has definite regional variations. Rood screens, for example, which were outlawed nationally by Archbishop Laud's reforms, survive much more frequently in the Welsh Marches and the west of England than they do elsewhere. *(Schofield, J., 1985-1990, pers.coms., Kelly, F., c.1989, pers.com.)*

In short, despite the large number of churches included in this survey, the findings cannot safely be generalised and applied to other parts of England.

The trials of profile recording and of ultrasound, described in chapters 7 and 10 respectively, cannot be described as *rigorous scientific experiment*. They are trials, rather than experiment, because they were conducted without replication or control. This does not imply that the results are without value. The trials were conducted methodically and conscientiously, but whilst the data they produced is real, it is in want of validation by fully rigorous experiment.

This section should not be read as an apology. The contribution offered by this thesis is the reporting and analysis of the field survey of church plaster, and not a study of the science underlying non-destructive testing techniques. The review and trialling of relevant non-destructive survey techniques *(chapters 9 and 10)* is intended to demonstrate that the technical issues raised by the survey do have potential means of resolution.

3.3.8 Time and cost constraints.

Time and money constraints upon the author have restricted the number of churches surveyed. The churches included in the survey were chosen randomly. All eligible churches had their names recorded on paper slips, which were placed into an otherwise empty wastepaper basket. An interior design student with no noticeable knowledge of, or interest in, historic architecture was used to randomly draw out the winning entries.

3.3.9 Reference to gazetteers.

The choice of sample was deliberately made without reference to gazetteers *(Pevsner, N., 1972, RCHM, 1952-70, Redundant Churches Fund, 1990.)* so that it would not be biased in favour of known plaster or wall painting survival sites.

3.4 Number of churches surveyed

The total number of churches given a full visual survey was 210. This represents around 80% of the Church of England sites in Dorset. What proportion of total Dorset church wall area has been surveyed is a material question. Sadly, collection of this data was beyond the means of the survey. No realistic guess can be made as to the answer. The exclusion of large urban churches, such as Sherborne Abbey, clearly has a disproportionate impact on the survey when considered by wall area.

3.5 Definitions.

The key definitions of *medieval* and *church* are discussed in detail in *chapter* 7.

Many other common words present some difficulty. Though literary style has not been one of the key ambitions of this project, some effort has been made to prevent terminal boredom through repetition of words and phrases. As an example, the only significance of the terms *early* or *old* is that the plaster (or other feature) is Pre-Reformation.

Victorian and nineteenth century should not be read as being interchangeable. Victorian has been used to describe the period from 1830 to the start of the First World War. This obviously includes the Edwardian era, but the conflation has no material implications for the project. *Nineteenth century* is used in a less stretched manner, and means the 100 years starting in 1800.

In practice, these differences make little real difference to the sense of the project.

3.6 Literature review.

3.6.1 Introduction.

Though extensive use has been made of literary sources to provide background information for this project, it has been essentially a exercise in primary research. Documentary research has revealed that no significant survey of plaster survival has been done before in this country. Only one source of evidence has been found directly concerning the use of ultrasound to locate overskimmed layers of plaster. *(Bertelli, P., 1983, pp.664-686)*. It is therefore unsurprising that the project does not contain large volumes of close textual analysis of existing literature.

3.6.2 Primary sources

Extensive personal communication with staff of the Dorset Record Office and local historians, notably Jo Draper, *(Draper, J., 1992-3, pers.coms.)* suggests the existence of only four large scale primary resources dealing with Dorset Church repair and restoration. These are :

i Salisbury Diocesan records. These are said to contain details of faculty applications (applications by the parish to the archdeacon, for permission to undertake building work), clergy appointments, and parish accounts from the early medieval period onwards, but this source was not pursued because of the decision to concentrate research effort on developing a more objective means of survey.

ii The Dorset County Chronicle newspaper. This was a high quality newspaper throughout the nineteenth century. It is known to have assiduously reported church developments. Limited research conducted suggests that these reports tended to concentrate on listing the great and the good, who were in attendance at re-consecration ceremonies, rather than technical building issues. *(See chapter 14.3.)*.

iii Architects' own records. Crickmay was one of the most prolific restoring architects in nineteenth and early twentieth century Dorset, and most of his drawings are now in the Dorset Record Office collection. It is likely that other restoring architects' drawings can also be located. However, the drawings themselves may be of relatively limited value. There is a notorious reality gap between architects' proposal drawings and what actually happens on site. Thus design drawings, without supporting contemporary correspondence, are probably of little utility to this thesis. *(Schofield, J., 1984 on., pers.coms., Bucknall, J., 1985 on, pers.coms., Baxter, A., c.1997, pers.com.)* In any case, the decision to concentrate research on ways of improving the objectivity of the survey, meant that this archive was not explored.

iv Prints, drawings and photographs. Scattered collections of prints, drawings and old photographs certainly exist. Jo Draper has found many in the archives of the Dorset Record Office. *(Draper, J., pers.coms., 1998 onwards.)* It is rumoured *(DRO staff, 2004, pers.coms.)* that the drawings of Heywood Sumner *(See biographical notes)* may contain some incidental information on restoration in progress. Many conversations occurred during the project with parishioners who thought they remembered seeing such drawings. The project was unable to locate any. The drawing of Loders church and the photograph of Broadwindsor *(below)* are probably a hint that a vast pictorial resource does exist. Only the restrictions of time and money have prevent this being fully researched.

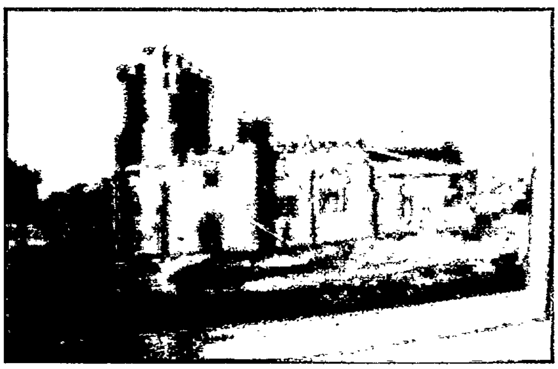


Figure 25.
Loders Church,, unknown artist, displayed in the church

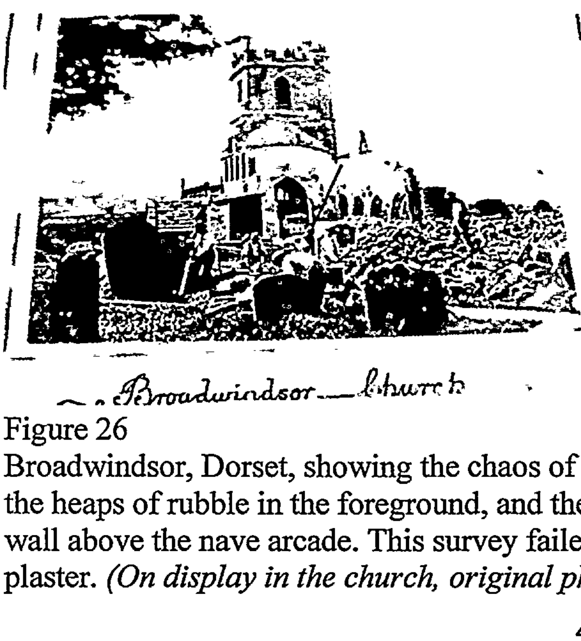


Figure 26
Broadwindsor, Dorset, showing the chaos of a nineteenth century restoration. Note the heaps of rubble in the foreground, and the apparently surviving areas of plaster wall above the nave arcade. This survey failed to find any evidence of surviving plaster. *(On display in the church, original photographer unknown.)*

Given substantially more time and resource, the project would have benefited from extensive direct access to all four of these resources.

The main source for the project has been the private notebooks of Sir Owen Morshead, held by the Dorset Record Office (D.1192/1/2/3). *(See chapter 13 for a brief biography.)* The notebooks are based on personal visits to all of Dorset's churches, conducted between the early nineteen fifties until circa nineteen seventy. The observations made during these visits are correlated with his extensive research in diocesan record offices, personal correspondence with living architects and research in architects' records. Morshead is frequently acknowledged by Pevsner as the source of much invaluable information *(Pevsner, N., 1972, passim)*. It is very difficult, if not impossible, to be certain of the independence of Morshead and the RCHM. They have both primarily drawn on the Salisbury Diocesan records. However, Morshead reports faculty applications in more detail than the RCHM, and appears to have devoted some effort to searching the main local newspaper source, *The Dorset County Chronicle.*

Pitfield, *(Pitfield,1981, passim.)* in the first, and so far only, volume of his projected series *Dorset Parish Churches,* appears to rely mainly on the Diocesan records supplemented with his own field visits.

Taken together, Morshead, Pitfield, the RCHM and Pevsner represent a formidable body of research into the Church of England's formal regulation of nineteenth and twentieth restoration. How far this documentation reflects the reality of the work carried out on site remains an open question.

Pevsner writes,

> *"The usual unpublished sources have also been open...Mr. Peter Ferriday's index of Victorian church restorations...and Mr Geoffrey Spain's abundant gleanings from the nineteenth-century technical journals." (Pevsner, N., 1972, p.11)*

Sadly for this project, all research efforts have failed to locate either of these sources.

Further exploratory work in the archives of the Society for the Protection of Ancient Buildings suggests that substantial quantities of relevant correspondence exist within their files, but significant research here was again outside the scope of this project

These limited explorations of primary documentary source material pose a fascinating dilemma. Size and time constraints have not allowed the corroboration of the projects' own primary survey data from contemporary sources. There are plainly considerable possibilities to follow up this project with further research.

3.6.3 Secondary sources

3.6.3.1 Introduction

The secondary sources used are best reviewed by subject area :

3.6.3.2 History and conservation

This project is only indirectly concerned with the art history of medieval wall paintings, and not at all with their iconography. Research into mural paintings has thus been pursued only where it is directly relevant to the central aims of the project.

This has posed the project a serious problem. There is a substantial literature on the conservation of painted plaster. Numerous specialist papers such as the copious output of David Park at the Courtauld Institute *(for example, Park, D., 1999)*, the papers from the International Symposium on the Conservation of Wall Painting 1979 (*Burman, P., Ed., 1986*). English Heritage's *Conserving the Painted Past :Developing Approaches to Wall Painting Conservation, 2003,* and large numbers of unpublished conservation reports lodged with the Council for the Care of Churches exist. However, there is a lack of literature dealing with the *extent of survival* of painted decoration. The main reference sources are Tristram's three volumes *(Tristram, E.W., vols. 1-3, 1944-, passim)* and Keyser's ground breaking survey. *(Keyser, C.E., 1883, passim.)* Together these represent a formidable body of scholarly survey, but they do not represent a complete inventory of surviving painted surfaces. The newspaper articles on the church at Southolt and on Worcester Cathedral *(See chapter 14.4.)* demonstrate that new areas of painted plaster are still frequently being accidentally discovered. This random and limited selection of recent media evidence is supported by the findings of this survey.

General architectural guides such as John Julius Norwich's *The Architecture of Southern England (Norwich, J., 1985),* Bannister-Fletcher's *History of Architecture (Bannister-Fletcher, 1948)*, Watkin's *History of Western Architecture (Watkin, D., 1986),* contain no significant discussion of plaster. Even in Joan Evan's book *The Flowering of the Middle Ages (Evans, J., 1985),* which contains copious illustrations of medieval decorative art, there is no mention of plaster in the section by John Harvey on *The Development of Architecture (Harvey, J., 1985, in Evans, J., 1985).* An honourable exception is Colin Platt's short book, *The Parish Churches of Medieval England (Platt, C., 1981),* which does discuss plaster.

The RCHM's volumes on Dorset, *(RCHM, 1952-1975),* manage a slightly fuller treatment of the subject :

> *"Paintings. Medieval ecclesiastical wall-paintings are very uncommon in the district and only the examples at Cerne Abbas are of importance. [!] These date from the 14th. Century and represent scenes from the life of St John the Baptist. There have been paintings of some importance over the chancel-arch at Puncknowle but these are not now identifiable. The paintings at Netherbury, discovered about 1850, have again been covered and the painting of the Mass of St. Gregory, formerly at Abbotsbury, has also disappeared. Remains of early painted decoration on the N. W. doorway of Sherborne Abbey are worth mention. There are 17th century figures of time and death in Loders church and texts etc., dated 1769 at Cerne Abbas." (RCHM, 1957, p.xiiv)*

This review can hardly be described as thorough, but it is perhaps excusable, since the RCHM was only recording *obviously* visible features and not testing for hidden material. The scale and depth of the treatment of wall paintings needs to be set in context with RCHM's concentration on other aspects of church furnishing. Four pages of large scale photographs are devoted to a single aspect of church plate. *(RCHM, West Dorset, 1957, plates 28, 28, 30, 31.)* It is particularly galling for this project that the much later RCHM volume *Churches of South-East Wiltshire (RCHM, 1987, passim)* places far greater emphasis on wall paintings than any of the Dorset volumes.

If the RCHM's survey is not complete, Niklaus Pevsner's *Building's of England : Dorset (Pevsner N.,1972, passim),* is occasionally amusing , as with his dismissal of Eype church

> *"ST PETER. 1865 by Talbot Bury. Nave, chancel, and N aisle. The porch is a lark, its walls being projecting (unnecessary) buttresses. - The PULPIT is a lark too. The carver was R.L. Boulton. - he also did the FONT." (Pevsner N., 1972, p.202)*

But more often, for this project, he is disappointing because of his concentration on anything but plaster. Church plate is a particular obsession. The idiosyncratic style would be forgivable, as well as amusing, if the basic architectural facts were completely reliable. An excellent example is the entry for Pilsdon church *(See chapters 7 and 8)* :

> *"ST MARY. 1830 and 1875, but including medieval features : e.g. the Perp five-light east window, the chancel arch, also Perp, and some corbels inside. The bell turret and spire must be of 1875. - PULPIT. Simple; C17. - STAINED GLASS. Who would believe that the glass in the east window could commemorate a death in 1918 - twenty-two years after the death of William Morris ? The artist was even so ill advised as to sign : Percy Bacon, London." (Pevsner, N., 1972., p.315)*

This description somewhat misrepresents reality. This evidence produced by this survey suggests that Pilsdon is a mainly medieval structure with minor later additions and modifications. Perhaps a balanced view is that Pevsner was an art historian and not a structural surveyor, and that the books are very fine brief, general gazetteers, as they were intended to be. It is not Pevsner's fault that his work is now commonly assumed to be definitively thorough.

Dorset, in common, with most English shire counties has its *Victoria County History (Pugh, R.B., Ed., 1968).* The Dorset volume has been valuable in two respects, firstly, provision of population data, and secondly, some useful background material on nineteenth century bishops and their attitudes to restoration.

Unique to Dorset, and to use Pevsner's words, definitely "a lark", is Hutchin's *History of the County of Dorset. (Hutchins, J., 3rd. edition, 1973 facsimile).* This book has a complex publication history, with three editions, each published in separate parts over the period 1774 to 1874. This research has used the facsimile reprint of the third edition. It is a fascinating and stunningly eclectic collection of antiquarian gatherings....an utterly absorbing Sargasso Sea of historical trivia. The poor organisation of the work, from a research standpoint, has limited its utility. There may be useful information on church plaster, but a determined reading has failed to find it.

Also unique to Dorset is F.P. Pitfield's *Dorset Parish Churches A-D. (Pitfield, F., 1981)* This contains a very useful analysis of primary sources for nineteenth century restorations. Sadly, though the detail is tantalising, it is rarely possible to correlate his research with the currently visible evidence as there is not quite sufficient detail given in the text. Even more sadly, there appears to be no realistic prospect of further volumes being published.

The otherwise excellent *Parish Churches of England* by Cox and Ford *(Cox and Ford, 1946-7)* dismisses wall paintings, and their supporting plaster, with little over a page of text but perhaps explains why they generally receive so little attention :

> *"Of the schemes of colour decoration that once covered the interiors of most medieval churches practically nothing remains; they have either been obliterated by a coat of Reformation whitewash or torn down at a later date with the old plaster covering of the walls. At the same time sufficient fragments remain, carefully catalogued and copied by modern scholars, to provide a fairly*

comprehensive idea of the characteristics of the mural painting at each phase." (Cox and Ford, 1946-7., p88.)

It is this assumption that *practically nothing remains* that has so diminished the interest of architectural writers.

In short, non-specialist architectural literature appears to largely ignore the paint and plaster in English churches.

There does not appear to be any significant body of specialist work dealing solely with church plaster. The specialist works of Keyser (*Keyser, C.E., 1883, passim),* Tristram *(Tristram, E.W., 1944, passim),* Caiger-Smith, *(Caiger-Smith, A.,1963, passim)*, Rickert, *(Rickert, M., 1954, passim)* and Rouse, *Rouse, C.E, 1968, passim)* deal with painted surfaces and have only a limited interest in the plaster below the surface. They are thus neither very relevant nor useful to this thesis. Most recent specialist technical literature focused on wall paintings is also sparing in its attention to plaster and also is predominantly conservation case based. This means that it does not attempt to estimate the extent of survival on a geographical area basis. *(for example, Dives, J., 1985, passim., Park, D., 1986, passim., Cather, S., 1991, passim., Arnold, c.1985, passim., Curteis, T., 1998, passim).*

To compensate for this lack of published material, considerable effort has, throughout the survey phase of the project, been placed on personal communication with experienced conservators, architects and local historians. The aim of this has been to try and determine the quantity of original plaster that might survive. Discussions with architects and other professionals *(John Schofield, Francis Kelly, John Bucknall and Tim Ratcliffe : for details see notes on personal biographies at the end of the bibliography)* have been particularly useful, as have contributions from staff of The Society for the Protection of Ancient

Buildings (SPAB), the Council for the Care of Churches and the Churches Conservation Trust.

3.6.3.3 Reformation changes

The political, social and economic changes brought about by Henry VIII's Reformation are well researched and argued in a wide range of literature. As these changes resulted, over an extended period, in the painting over *(see chapter 2)* of almost all English wall paintings, they have received substantial research effort. Three texts are used to provide the background on which to discuss the results of the Reformation, Scarisbrick's *Henry VIII (Scarisbrick, J., 1971),* Bindoff's *Tudor England (Bindoff, S., 1950),* and Dickens' *The English Reformation (Dickens, A., 1964).* It must be stressed that while they are invaluable for general background, the destruction of images does not form a major area of interest in any of these texts. None specifically discuss the removal, or other treatment, of church plaster.

3.6.3.4 Ecclesiology and the Oxford Movement

The nineteenth century reform of pluralism and other abuse within the Church of England is an enormous subject. It is only relevant to this project because the reformers saw church architecture as an integral part of their crusade for the reinvigoration of the church. *(Ecclesiological Society Handbook, 1847, passim).* A very useful and concise discussion has been found in Nicholas Bentley's *The Victorian Scene : 1837-1901 (Bentley, N., 1971).* Further limited but useful information was gathered from *The Victoria County History (Pugh R., Ed., facsimile, 1968)* for Dorset.

3.6.3.5 Architectural fashion and argument

The argument between restorers and repairers has generated far more literary heat than light. The anti-restoration case requires the reading of Ruskin's *Seven Lamps of*

Architecture (Ruskin, J., c.1930), since most anti-restorers use it as a talisman. It is a brave reader that can claim to have fully understood its impenetrable ferocity. It is a matter for great regret that there is no definitive written discussion of the merits of repair over restoration. Neither does the pro-restoration case appear to rest on any written manifesto. Mark Chatfield suggests in his *Churches the Victorians Forgot, (Chatfield, M., 1989, p.9)* that Pugin's literary output *(Contrasts, 1836, and The Principles of Christian Architecture, 1841)* was very important in fuelling the beginnings of the fashion for restoration.

The activities of famous national figures in architecture such as Street, Ferrey and Gilbert Scott, provided inspiration to local Dorset architects, such as Hicks or Crickmay, by physically restoring buildings rather than writing about what they had done. Perhaps Cocke and Buttresses' *900 years : The Restoration of Westminster Abbey (Cocke, T., 1995 passim)* comes as close as anything to a literary celebration of the restorer's philosophy.

3.6.3.6 Economics and attitudes.

There is a plausible argument that nineteenth century restoration would not have been possible without the wealth produced by industrialisation and colonisation. This argument has been examined with the help of supporting texts : Nicholas Bentley's *The Victorian Scene : 1837-1901 (Bentley, N., 1971),* Eric Hobsbawm's *Industry and Empire, (Hobsbawm, E., 1969)* and Mayhew's *London Labour and the London Poor (Mayhew, H., 1985 edition).* None of these sources deals directly with the destruction of wall paintings or plaster, but taken together they make a strong case that the wealth of the nineteenth century was bought at the cost of intense guilt on the part of many of the wealthy. (The works of Charles Dickens might well form an equally valid basis for this area of discussion.) It is this combination of wealth and guilt that was the fuel driving the Victorian restoration movement.

3.6.3.7 Landscape and geology

No discussion of material usage or of decay mechanisms can be sustained without reference to landscape setting in which a church is placed. The materials used for church building are usually very local in origin, and problems of dampness and salt decay are frequently driven by the way the church is fitted into the local topography. Discussion of this issue is supported by reference to Hoskin's *Making of the English Landscape (Hoskins, W., 1955, passim), The Geology of the Country Around Weymouth, Swanage, Corfe & Lulworth, (Arkell, W.J., 1947, passim)* and by Jo Thomas' articles on the building stones of Dorset in Dorset Natural History and Archaeology Society Proceedings *(Thomas, J., 1993 and 1994, passim).*

3.6.3.8 Materials and techniques.

The materials used for paint, plaster and supporting structure are discussed with material from a very wide range of texts, personal communication and personal unpublished research. Key texts have been Bowyers' *History of Building, (Bowyer, 1993, passim),* Cennini's *Craftsmans Handbook (Cennini, d'A.C., 1960, chapter XVII), Painting Materials, a Short Encyclopaedia (Gettens, R.J., 1966).* Holmes' and Wingate's *Building with Lime (Holmes, S. and Wingate, M., 1997, passim),* Pasley's *Observations on Limes (Pasley, C.W., 1997, passim),* Salzman's *Building in England Down to 1540 (Salzman, L.F., 1952, passim),* Lauren Sickels' *thesis on mortars (Sickels, L.B.,1987, passim),* Thompson's *Materials and Techniques of Medieval Painting (Thompson, D.V., 1936, passim) and* Vicat's *Mortars and Cements (Vicat, L.J., 1997, passim).* Though all the texts noted have contained much useful background material, none directly addresses issues special to church plaster. This area of the thesis has thus been heavily dependant on direct personal experience and personal communication with architects and other professionals.

3.6.3.9 Structure.

Limited use has been made of Stroud's *Mitchell's Structure and Fabric (Stroud, F., 1994)* and its companion volume Everett's *Mitchell's Materials (Everett, A., 1995).* Both have rather too modern an outlook to be completely relevant to ancient church structure and materials. More useful is McKay's *Building Construction (McKay, W., 1963),* because editions from before the nineteen sixties revolution in materials and techniques still contain much information directly relevant to medieval building techniques. David Watt's *Building Pathology Principles and Practice (Watt, D., 1999)* also offers a more old building friendly approach.

Discussion of stone, timber, earth, thatch, metal and glass is supported by material from the five volumes of the English Heritage *Practical Building Conservation (Ashurst, J., 1988)* series by John Ashurst (et al.), together with material from *Stone Quarrying and Building (Parsons, D., 1990)* edited by David Parsons. Clifton-Taylor and Ireson's *English Stone Building (Clifton-Taylor, A., 1983)* has also provided useful background. Personal communication and direct personal experience and research (unpublished) has, yet again, been rather more useful than any of the published sources in this area. For example, personal communication with the early supervisor *(McHaigh, I., c.1985, pers.com)* of much of English Heritage's testing for the *Smeaton Report (Teutonico, J-M., 1994)* produced more information than was included in either the written drafts or the published version.

Mortar and plaster are discussed using knowledge from personal communication, personal experiment (unpublished) and printed sources. The *Journal of The Building Lime Forum, (1993-2003, passim)* has been an excellent resource for technical information, as has Neville's *The Properties of Concrete (Neville, A., 1983).* Concrete is an interesting example of just how much the technology of modern materials could be used to inform the study of their historic predecessors.

Discussion of decay processes is based on material in Ashurst's *Practical Building Conservation (Ashurst, J., 1988)* series, Mitchell's *Materials (Everett, A., 1995),* Watt's *Building Pathology (Watt, D., 1999),* a selection of EH's collection of papers under the title *Conserving the Painted Past (English Heritage, Eds., 2003),* and very extensive personal communication and even more extensive personal unpublished research. *(See note on the author of this thesis in the biographical notes at the end of the bibliography, chapter 13.4)*

3.6.3.10 Survey design

Survey techniques were based on personal field experience supplemented by detailed discussion with Ross Dallas, Charles Hippsley-Cox, Jo Cox , Rex Butland, Robert DeMaus and Stephen Wilmot *(For biographical notes see chapter 13.4).*

The statistical considerations behind choice of sample and analysis of data were supported by Open University course material from the M248 course.

3.6.3.11 Wall paintings

This literature review would be incomplete without mention of an area of technical writing which proved of surprisingly little value. There is an extensive specialist literature on most aspects of the art history of wall painting, but much less on the technical aspects of these paintings and their decay. One fascinating example is the lack of discussion of Professor Tristram's conservation activities. *(See also chapter 14.6.3.11.)* He developed a technique of waxing wall paintings which has proved to be very damaging in the long term. Removal of this wax has been a major activity with wall painting conservation for many years. But the literature of wall painting conservation makes only occasional and oblique reference to the affair. More seriously, research for this project has revealed almost nothing on the survival and decay of the plaster which supports the paintings. There do not appear to be any previous extensive surveys on the survival of Pre-Victorian church plaster.

3.6.3.12 - Non-destructive testing

This was approached primarily from an archaeological rather than a materials testing point of view, and with hindsight, this bias cannot be said to have strengthened the whole project. This issue is discussed in detail in the final conclusions section of the the thesis *(chapter 11.1)*.

Internet research and personal communication *(Bhardwaj, M., 2005, pers.com)* at the very end of the project suggests that the knowledge base in archaeology is some way behind that of the materials testing world, particularly with reference to the use of ultra-sound. This problem is, perhaps, an inevitable result of the multi-disciplinary nature of the project as a whole.

Extensive use was made of wide variety of archaeological texts. These included Blake *(Blake, V., 1995)*, Clark *(Clark, A., 1996)*, Dorrell *(Dorell, P., 1989)*, Conyers *(Conyers and Goodman, 1997)* and Gaffney *(Gaffney and Gater, 2003)*. This material was supplemented and combined with electronic material from The Ultrasound.Info web site and the Ultran.com web site.

Comment on the possibilities and relevance of medical ultrasound was based on Bushong's book *(Bushong and Archer, 1991)* heavily supplemented by personal communication with radiologist employed by the South Dorset NHS Trust *(See biographical note on "Radiologists" in chapter 13.4)*.

The personal communications from Robert deMaus (see *chapter 13.4 Biographical details*) served to place all the secondary source material mentioned above in a practical context. These communications took the form of two whole day discussions and numerous 'phone calls. The content of the printed and electronic material published by deMaus was of relatively little significance when set against his generous personal contact.

3.7 Scope for further research : Weaknesses and limitations of literary research

Though the thesis contains a substantial literary source research effort, this is not the main basis of its contribution. The core of the contribution lies in the primary survey data gathered by the field research.

The ideal project would completely explore all aspects of its chosen subject, but research is a cruel master. At the beginning of the project it was assumed that very little evidence of early or overskimmed plaster would be found. The secondary sources all seemed to make this clear. The reality is that a very great deal of plaster survives and so the effort required by the survey grew and grew.

The discovery of large scale Victorian overskimming, again contrary to expectations, caused a fundamental shift in the focus of the project. There was clearly a need to develop a system of objectively surveying for this buried plaster. A choice had to be made between researching non-destructive surveying *(chapter 9)* and the testing of ultrasound equipment *(chapter 10)* or detailed work searching for documentary evidence on church history. This was not an easy choice, and there was probably no right answer. On a personal level, finding some, possibly much, useful archival information would have been both pleasant and easy. The problem was primarily the open-ended nature of such research. It seemed eminently possible that extensive research in the Dorset Record Office could easily double the length of the whole project.

In contrast, reviewing the options for non-destructive survey appeared to offer much better defined scope for research. Yet here also, significant problems became apparent. The research effort needed to integrate the scientific expertise that exists within materials testing, with the historical and conservation outlook of the project proved very demanding.

Two further projects await anyone willing to ;

i research the local primary sources for Dorset church plaster history, or

ii marry an in-depth review of the theoretical physics of ultra-sound with the practical needs of an objective means of surveying for church plaster.

4. What is plaster ?

4.1 Introduction.

The purpose of this chapter is to introduce and support the discussion of decay in Chapter 8 by outlining the technical issues behind the materials and techniques used by medieval plasterers. In other words, to understand the probability of plaster survival it is necessary to understand why it might fail, and if failure might be inherent in the materials and working practices used by medieval plasterers.

4.2 Definitions

(See also glossary, chapter 13.6.)

According to the Encyclopaedia Britannica plaster is :

> *"one of the most ancient handicrafts employed in connection with building operations" (Encyclopaedia Britannica,1950, p.39).*

It is simply

> *"The art of covering the internal faces of walls..." (Chambers Encyclopaedia, c. 1895, p.226)*

With the exception of harls *(see glossary, chapter 13.6.)*, and other renders applied by throwing, *(Hadlington, M., 1988-2005, pers. coms.)* there was little difference in the materials or techniques and finishes used by medieval plasters for internal and external surfaces. Hence for medieval work there is little real distinction between external renders, plasters or mortars. The situation changes from approximately the seventeenth century when the use of large quantities of hair in internal plasters differentiates them from external render or bedding mortar, where hair is very rarely found. *(See below, chapter 4.8.) (Ratcliffe, T., 1986-2003, pers.coms.)*

4.3 Development of materials and techniques.

Most plaster employed on high status buildings in this country, up to the late eighteenth century, used non-hydraulic lime as a binder *(Holmes and Wingate, 1997, chapter 1).* This posed technical difficulties, which are discussed in detail below, but had one great advantage over modern plaster. Non-hydraulic lime based plasters set very slowly, often remaining workable for days, rather than hours. This slow set allowed extensive hand modelled shapes to be created.

Figure 27
Abbotsbury, Dorset :
Hand modelled plaster ceiling.

Another major advantage of non-hydraulic lime based mortars is their ability to be run-out *(See glossary, chapter 13.6)* to form feather-edges *(See glossary, chapter 13.6)*. In other words, to be thinned gradually to nothing at their edge. This allowed medieval plasterers to create seamless junctions between plaster surfaces and masonry details such as window reveals. *(See chapter 5)*. *(Schofield, J., 1985-1995, pers.coms.)*

Crucially for this project, a strong tradition of hand working and modelling appears to have developed from early in the medieval period. Hand working did not involve the use of moulds, and rarely, if ever, involved the use of rulers. The medieval lime plasterer's guide was his eye, and the plaster is said to have been applied using small wooden or leather floats. *(Ratcliffe, T., Schofield, J., Young, R., 1982-2004, pers.coms.)* This combination of eye and tool explains why medieval plastered surfaces often have a slightly undulating surface…a waviness.

It is this distinctive waviness, as opposed to the flatter surface of more modern plasters, that makes a visual survey of the extent of medieval plaster survival possible. Since the identification of old plaster relies so heavily on the waviness of its surface the subject is discussed separately in *Chapter 5.6.*

Waviness was also partly due to economics. Lime was one of the most expensive materials used in medieval building *(White, P., 2003, passim., and 2002-2005 pers.coms., Salzman, L.F., 1952, chapter IX.)*. It was (and is) expensive because of the large quantities of fuel needed to fire the kilns in which it was produced. *(Holmes and Wingate, 1997, pp.9, 203-5.)* Its cost was sometimes reduced by gauging *(See glossary, chapter 13.6)* it with clay, and usually by mixing with sand. Even so, it remained an expensive material. Thick layers could only be applied at great cost, so the medieval plasterer worked thinly. Thin plaster has to follow the surface of the substrate and so takes on a wavy surface.

There was another technical reason for avoiding thick layers of lime plaster. Lime plasters have to be plastic for them to placed on a wall or a ceiling. The only practical way of obtaining this plasticity is to add water. Because the lime sets slowly, *(see below, chapter 4.5)* this water is lost before the plaster has hardened. As the water is lost the plaster tends to shrink. The shrinkage causes cracking that is very ugly and can make a plaster structurally unsound. Good working practice has always been to combat shrinkage cracking by applying the plaster in as thin a layer as possible. A thin layer of plaster, applied to a wall made of undressed rubble stone, will tend to follow rather than hide the irregularities of the stones behind it. Thus, avoidance of shrinkage cracking is another reason for the medieval wavy surface.

To sum up, medieval plaster often has a highly distinctive slightly wavy surface due to a combination of working practices, economics and the technical properties of lime plasters. A full discussion of how wavy the medieval surface could be can be found in chapter 5.

From the nineteenth century onwards, plasterers made increasing use of natural cements and hydraulic limes *(Sickels, L.B., 1983, passim., Swan, S., 1996, passim.)* These differ from non-hydraulic limes by virtue of complex internal chemistry. *(see below, chapter 4.5) (Neville, A.M., 1983, chapter 2.)* There was (and is) a great variety of these materials *(Vicat, L.J., 1997, passim,. Pasely, C.W., 1997, passim.)*, but all share one common characteristic...they set quickly. One, the so called "Roman Cement" (actually neither Roman, nor cement) *(Swan, S., 1996, passim)*, for example can set within 20 minutes in hot weather *(Wingate M., 1992, pers.com)*. Coping with rapidly setting materials required new working practices. Plasterers adopted the use of very large floats to rule the plaster surface flat, because that was not just the fastest way of working, it was the only way of working with the new materials. The final finish of the work became mainly governed by the behaviour of the plaster itself rather than by aesthetics or economics, though development of factory produced tools in the nineteenth century was also a factor.

The natural cements and hydraulic limes of the nineteenth century have, in turn, given way to modern plastering systems. These are usually based on Portland Cement (OPC) and Gypsum plaster. Few of the churches in the survey have had large scale applications of these modern materials, though localised low level repairs have been observed *(see Chapters 7 and 8)*. Experts, especially those informed by SPAB, generally agree that OPC and gypsum based plasters are unsuitable for repairing buildings that do not have damp courses *(see chapter 14.6.4.4)*. OPC tends to produce dense, water-proof plasters that divert dampness problems to adjacent areas of wall surface *(Ashurst, J.,1984, passim.,* *Hughes, P., 1986, passim.)*. Gypsum based plasters are severely damaged by dampness and usually fail rapidly for this reason when used for church repairs *(see chapter 14.6.4)*.

Very confusingly, the "plaster" that has become synonymous with modern wall decoration, was very rarely used in the medieval plastering in churches *(Wingate, M., Hadlington M., Schofield, J., 1983-2005, pers. coms.)*. "Plaster" in the modern sense is taken to mean Gypsum. Gypsum has a rapid chemical set which requires an entirely different craft approach by the plasterer. Work has to be completed quickly, often within minutes rather than hours.

4.4 Placing and Working

Medieval plasters were mixtures of different materials, each fulfilling different functions. These are discussed in detail below. However, it is worth noting that the academic knowledge base relating to the composition of medieval mortars is not extensive. The main problem here is that most of the available written sources *(for example, Ashurst, J., 1984, passim.)* are more fairly regarded as architects diaries than academically rigorous works. The authors' own knowledge is based on the visual examination of mortars and plasters encountered during site work. *(See preface and biographical notes, chapter 13.4)*. Though this examination has been diligent and has extended over many years and a wide variety of sites, it is not without weaknesses. For example, it is usually impossible to precisely identify the type of lime used in a mix by simple visual examination. This empirical evidence gathering has been supplemented by research into the texts cited below, and refined during informal discussions with other contractors/architects, the Technical Panel of the SPAB, and the membership of the Building Limes Forum.

4.5 Binder.

This was the function of the lime in the mix...literally to bind together the other components, and to adhere the whole mix to the substrate. In lime/clay composite mortars and plasters, the clay also acts as a weak binding agent.

Building lime is produced by heating calcium carbonate (limestone rock or coral) to at least 950°c. This causes the calcium carbonate to decompose to calcium oxide. Calcium oxide (commonly known as quicklime) reacts violently with water to produce calcium hydroxide. If this reaction is precisely managed the result is a dry powder of calcium hydroxide. If excess water is used, a paste (lime putty) is produced. This paste (putty) is the material that was used by medieval plasterers as the binder in their mixes. *(Holmes and Wingate, 1997, passim.)*

Building limes fall into one of two general groups : hydraulic and non hydraulic.

4.5.1 Non hydraulic lime

On exposure to air, lime putty carbonates. It returns chemically to calcium carbonate by combining with carbon dioxide from the atmosphere. The carbonation process completes what is often described as the lime cycle *(for example, Holmes and Wingate, 1997, p.8)*, but this does not mean that it regains its former physical structure. A hard limestone (for example, Carboniferous limestone from the Derbyshire Peak District) does not produce a harder set lime than any of the softer limestones.

The carbonation process can be very slow. Some *(for example, Ashurst, J., lecture at King's Manor, York University, 1983)* have suggested that the carbonation of lime in the middle of medieval castle walls is still not complete today. The carbonation process yields a final set to lime mortars. It is often confused with the hardening of the mortar that results from their drying out. Although both processes yield a solid material, the strength and adhesion of *dried* lime mortar is much lower than that of *set* lime mortar. *(Induni, B., 1982-2005, diary notes, unpublished.)*

4.5.2 Hydraulic limes

Hydraulic limes take their name from their ability to set under water (without the need to react with atmospheric carbon dioxide) which made them highly desirable for hydraulic works such as harbours or canals. *(Holmes and Wingate, 1997, p.267; Vicat, L.J., 1997, passim., Pasely., C.W., 1997, passim.)* This setting power is derived from the behaviour of impurities in the calcium carbonate during the kilning process. These impurities vary but are typically rich in silica. In the kiln this silica reacts with the calcium carbonate to form complex compounds including di- and tri-calcium silicate. When combined with water, these compounds form insoluble precipitates : they set chemically. The chemistry is actually very complex and a full discussion is outside the scope of this thesis. *(Neville, A.M., 1982, chapter 2.)*

As noted above, the nineteenth century appears to have seen a move away from non-hydraulic lime mortars towards hydraulic limes, but there are substantial uncertainties. Little or no systematic analysis of historic mortars and plasters has ever been undertaken to determine whether medieval limes were hydraulic or non-hydraulic. *(Sickells, L-B., 1987, passim., White, P., 2003, passim.)*

4.5.3 Pozzolanic mortars and plasters

A pozzolan is any material that will promote the chemical set of lime. *(see glossary, chapter 13.6)* Pozzolanas appear to have been first used by the Romans, who discovered that volcanic ash from Pozzouoli caused non-hydraulic mortars to set independently of the carbonation process *(see glossary, chapter 13.6)*

Using crushed brick as a pozzolana has been shown by the *Smeaton Project (Teutonico, J.M., et.al., 1994, passim.)* to be a particularly effective additive for non-hydraulic lime based mortars. Durability, especially frost resistance, is greatly enhanced. *(Teutonico, J.M. et al, 1994, passim., McHaig, I.,et al, 1988, passim.)*

However, our current understanding of pozzolanas has only marginal relevance to medieval plasters as there is no evidence that medieval plasterers deliberately set out to use such materials. What seems fairly likely is that, by exercising poor materials sourcing and kiln control, medieval lime makers were accidentally including pozzolanic material into their limes. From the opposite point of view, it is only the complex and skilful control of the modern lime making process that has allowed the production of pure non-hydraulic limes.

This project has not found any evidence that the inclusion of pozzolanic material into medieval plasters has had any effect on their design, use or durability.

4.5.4 Natural and patent cements

Natural and patent cements appeared in large quantities towards the end of the eighteenth century, but their earlier use in medieval plasters is unknown. The chemistry of natural and patent cements fits between that of non-hydraulic limes and that of Ordinary Portland Cement *(Ashurst, J., 1984, p.12)*. It is complex and not within the scope of this thesis. However, like OPC, natural and patent cements generally set when water triggers a reaction between the calcium hydroxide and fired silica compounds that are present. This produces widely varying proportions of di- and tri-calcium silicate. *(Sickels, L.B., 1983, passim., Swan, S., 1996, passim., Holmes and Wingate, 1997, p.267, Vicat, L.J., 1997, passim., Pasely,, C.W., 1997, passim.)*

The motive behind the increasing nineteenth century use of natural and patent cements was generally the need for a quicker set to facilitate faster building. There is every reason to suppose that nineteenth century church restorers made heavy use of these materials, though this project has not gathered data in this area.

As noted above, the fast set given by natural and patent cements is one of the main reasons why nineteenth century plasters have different surface finish to those applied by medieval plasterers. *(See above, chapter 4.3.)*

4.5.5 Portland cement

The name Portland Cement covers a complex family of related materials. By far the most commonly used is Ordinary Portland Cement. *(See glossary.)* For the purpose of the discussion here, all reference is to Ordinary Portland Cement (OPC).

First patented by Joseph Aspdin *(Ashurst, J., 1984, p.13)*, OPC got its name from a supposed resemblance in colour and texture to Portland Stone. An early example of modern advertising, perhaps. It is an artificial mixture of limestone and clay that are kilned together at high temperature (1450°c.). This causes the formation of complex calcium silicates, that set when hydrated *(Neville, A.M., 1983, chapter 1)*. Speed of set, reliability of supply, consistent performance and exceptional mechanical strength have caused OPC to displace almost all other binders. This is a far from ideal state of affairs since, for all its benefits, OPC has serious defects. These are not within the scope of this project.

As with natural and patent cements, OPC based mortars demand different working practices to lime mortars. Where OPC is used for a plaster it demands rapid work that is only usually possible if plaster surfaces are ruled flat. It is very difficult to replicate the wavy surface of medieval mortar when using OPC as a binder.

4.5.6 Gypsum

Gypsum is a hydrated form of of calcium sulphate. It has wide range of physical attributes that depend primarily on the temperature used when it is converted from alabaster, its mineral form. Although modern usage has made the word plaster synonymous with gypsum plaster, it is doubtful if that gypsum was ever used on church walls by medieval plasterers. Ashurst suggests that gypsum was used for both external and internal historic plasters *(Ashurst, J., 1984, p.16-18)*. However, he cites no references and gives no details of locations, so this evidence must be treated with some reserve. Certainly this project has discovered no medieval use of gypsum plaster for general wall surfacing.

Plaster of Paris (one form of gypsum plaster) was widely used as an adhesive for bonding stone cladding panels onto the core work of tombs from the late medieval period onwards.

The Victorians developed several patent modified forms of gypsum plaster (for example, Keenes' Cement and Parian Plaster, that were widely used for exposed details such as the corners of window and door reveals. *(Ashurst, J., 1984, p.16-18)*. The survey discovered numerous examples of the materials in restored churches. No evidence was found of any medieval use of equivalent materials.

4.5.7 Other binders

Dolomite *(see glossary, chapter 13.6)* has, historically, been used quite widely in the north east of England as a source material for building limes. *(Holmes and Wingate, 1997, p.14-15, 208.)* It is currently widely used in the USA for this purpose. *(Thompson, M., 2004, pers.com.)* Though there is substantial evidence of widespread historic use of Dolomitic limes in Yorkshire and Nottinghamshire, this is most probably due to the local availability of the material. There is no reason to suppose that medieval plasterers in Dorset would have used an exotic material when plentiful sources of high-calcium lime could be found locally.

Magnesium-Oxychloride has had limited use as a conservation material. Severe long-term expansion problems have developed where it has been used on the Parthenon, Athens. *(Deli, M., and Sapouna S., pers.coms 1997-8.)* This survey has found no evidence that magnesium Oxychloride was ever used by medieval plasterers in Dorset.

4.5.8 Field recognition of binders.

It should be noted that the comments above on the use of binders discovered in Dorset by this project are based solely on visual examination with the unaided, if informed, eye. It is often very difficult or impossible, during field survey, to identify binders with any certainty, so none of the above comments should be regarded as proved. *(See Holmes and Wingate 1994, p.208-230 for discussion of possible field tests).*

4.6. Aggregate.

This could be drawn from a wide range of materials. Sand was commonly used, as were stone dusts and run of kiln material. *(See glossary.) (Holmes, S., and Wingate, M., 1997, p.9, and p.274)* .

Aggregate reduces the cost of the plaster by minimising the use of expensive lime and helps to reduce shrinkage cracking. Colour and texture are also imparted, particularly by strongly coloured sands, though it is doubtful that medieval plasterers ever saw this as an advantage, since they appear to have always finished fine plastering with a thin skim coat of almost neat binder. The evidence for this observation is derived primarily from the authors' conservation work (1982-2005) at Spetchley Church, Worcestershire, Duxford Church, Cambridgeshire, and the churches surveyed in this project.

4.7 Additives.

Water is the chief of these. Necessary to make the plaster workable and essential to provide initial adhesion of the plaster to the substrate, it is also the cause of unwanted side effects. *(See below, chapter 4.9.)*

Around the world, it has been common practice, for a very long time, to add sugar to lime mortars. The prime purpose appears to have been to retard drying and so minimise the problems of shrinkage cracking and segregation *(see below, chapter 4.9).* Holmes and Wingate *(Holmes and Wingate, 1997, p. 56)* suggest that the solubility of lime in water may also be improved, but do not elaborate on the chemistry of this. This project has been unable to determine whether any of the plaster in Dorset churches, regardless of date, has had sugar added. There appears to to be no literature on the long term effects of sugar on the durability of lime mortars, though it is reasonable hypothesis that sugar must promote biological colonisation and thus accelerate decay. *(Holmes and Wingate, 1997, p. 66).* Salt has been commonly added to lime based paints within living memory. Holmes and Wingate *(Holmes and Wingate, 1997, p. 56 and 66)* suggest that the effects of salt are very similar to those of sugar, that is, increasing the solubility of lime in water, but again do not support this view. The addition of any soluble mineral salt could be expected to have a damaging long term effect on plaster *(Price, C.A., c.1993, passim, 1996, p.7-9, c.2000, passim).* However, although much of the deterioration of church plaster in Dorset in undoubtedly due to salt contamination, it is impossible to say whether this is derived from external sources or is the result of deliberate salt addition.

Other additives present a complex and little understood problem. It seems very probable that proteins, such as egg, blood, milk and cheese were deliberately added to lime mixes to gain a measure of waterproofing. *(Howell, J., 1999, passim.)* However, research in this area is far from convincing. This is a pity since such additives may have played a crucial role in regulating the water movement in the lower parts of church walls and thus in the survival and failure of medieval plaster.

4.8 Hair

Animal hair was often added to plaster to control shrinkage cracking and to produce a more durable layer that could tolerate local loss of adhesion without completely failing. Heavy use of hair (occasionally up to 30% of the whole mix by volume) appears to be a post-medieval development, and not a feature of early plasters. This observation is based on the author's contracting experience at Churches Conservation Trust Churches in the Midlands, principally at Spetchley in Worcestershire and Longford in Shropshire. Horse hair was the most commonly used, with ox/cow hair also used in large quantities. Observations over a ten year period (1984-1994) suggest that Wool appears to have been rarely used, presumably because it had more value in the clothing industry. Similarly, flax was never observed in mortar or plaster. This is supported by observations of the mortar maker, David Chard. *(Chard, D., pers.com., 2000)*

4.9 Mixing, placing and segregation.

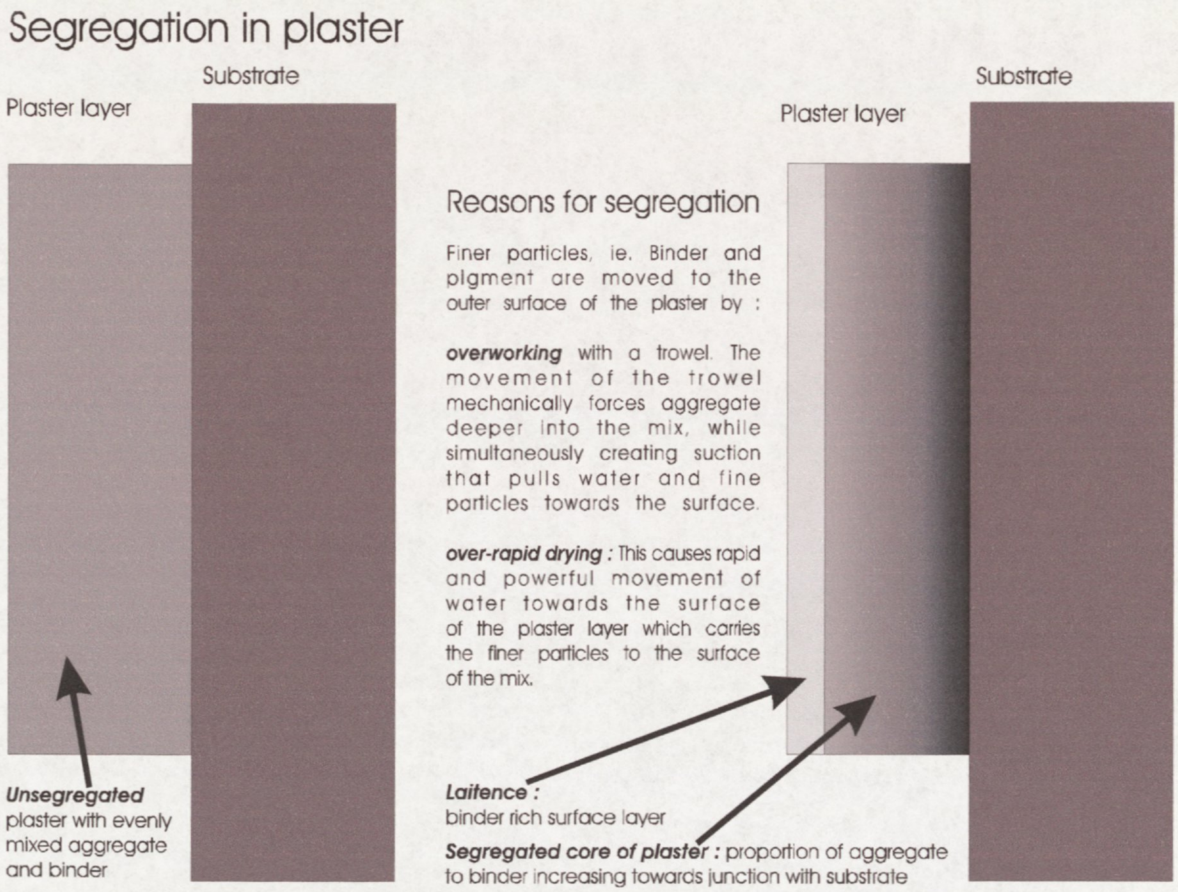
Mixing varied materials described above has never posed serious difficulties for plasterers. Though it was undoubtedly heavy work, labour was cheap and high levels of skill were not required. However, placing the mixture is a different matter.

Picking up, transporting, placing on the wall and working to a smooth surface all tend to segregate the plaster mix. Segregation describes the process whereby the coarser particles in the mix (generally the aggregate) tend to be pushed into the plaster layer, whilst the finer particles (the binder) are pulled up to the surface. *(See figure 28, below.) (Neville, A.M., 1983, p. 223.)* The more the mix is worked, after being placed on the wall, the worse the segregation will be.

The practical effect is that a surface skin of binder-rich material is created over a weak interior of binder-starved material. If a plaster layer is badly segregated, it is much more likely that the whole layer will lose adhesion and fail. We do not know if medieval plasterers understood this problem or how much of their plaster failed because of it.

One way of minimising the problem is to throw the plaster mix onto the wall as opposed to using a trowel or float to apply it. This technique has been widely used throughout the world, *(Holmes and Wingate, 1997, pp.112-117 and 278)* but no evidence of its use was found by this survey.

Figure 28



4.10 Secco work

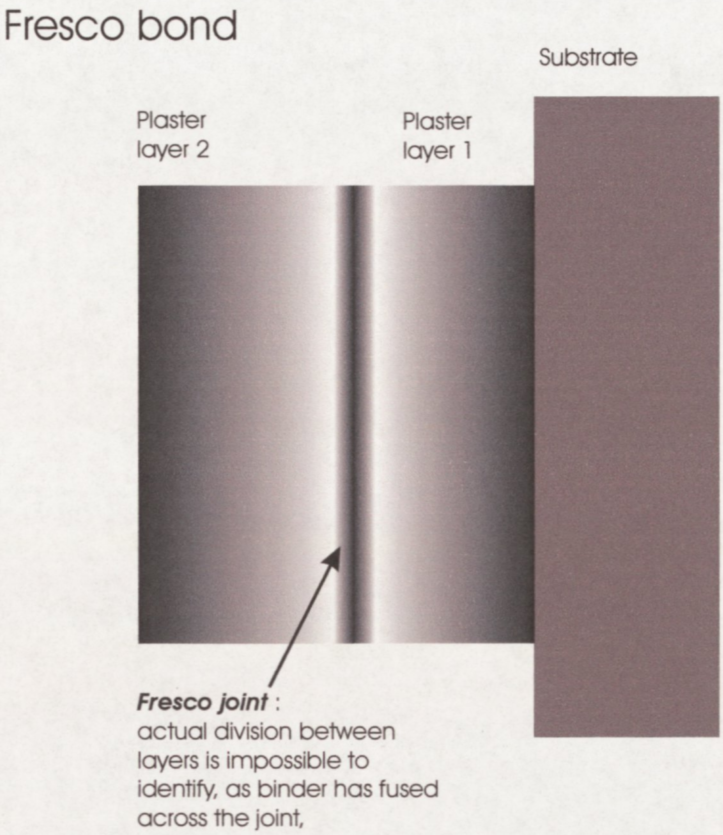
The problem of shrinkage driven cracking in lime plaster, as noted above, is best minimised by applying plaster in thin layers. This brings another set of problems. Plaster repair experience by the author (1983-2005) suggests that plaster layers rarely fail within themselves, they fail at their junction with the substrate or their junction to adjacent layers . *(See chapter 14.6.4.)* Secco work or dry jointing between layers of plaster is always an inherent source of failure. Much medieval plaster in Dorset will have been lost for this reason alone. No secondary sources appear to exist that deal with the issue of how rapidly medieval work failed, but it is likely that parish accounts, for example, might contain extensive information. The problem here is that effective research requires someone who understands the records *and* the technology to which they refer.

Since at least the eighteenth century plasterers have gone to some length to establish a mechanical key between layers of plaster by scratching a pattern on the outer surface of each layer before it sets. *(Ashurst, J., 1984, p.48-50.)* There is little or no evidence that medieval plasterers took the trouble to do this. This lack of evidence highlights a wider problem. Little is known about how and why medieval craftsmen worked on a daily basis. *(Salzman, L.F., 1952, pp. 30-68, 149-172 and 187-195.)*

4.11 Fresco work

Described in detail by Cennini in *The Craftsman's Handbook, (Cennini d'A.C., 1960, chapter LXVII)* and brought to great fame by Michelangelo, the technique called fresco involves applying fresh layers of plaster or paint before the layer below is fully dry. This is difficult and skilful even when working with small areas of lime based paint. It is possible, but exceptionally difficult, when applying a large area of plaster on top of another. In order to achieve the fresco bond between layers, the first layer must not have dried, but must have developed sufficient mechanical strength to support the next. These conflicting needs give rise to a very narrow window of opportunity. Fresco bonds between plaster layers are quite distinctive, even to the naked eye, when viewed in cross section. No evidence was observed of any fresco bonding between plaster layers of any date in any of the churches surveyed. It is therefore probable that key loss between plaster layers has been a major factor the accidental historic loss of much Dorset church plaster.

Figure 29.



4.12 Waviness : A key proposition behind the project research.

Surprisingly little is known for certain about the process of medieval plastering. Published authorities offer almost no information on how it was actually done. *(Salzman, L.F. 1952, passim., Bowyer, J., 1993, passim., Millar, W., 1897, passim., Bankhart, G.P., 1908, passim.)* However, personal observation by the author, throughout England, makes it clear that the materials and techniques were neither experimental nor locally varied. It is probable that this homogeneity extends widely across northern Europe. *(Ratcliffe, T., 1999, pers.com. and Young R., 1984-2003, pers.coms.)*

It follows that the waviness of medieval Dorset church plaster was not accidental, but was seen simply as good practice, or how a plastered wall should look. *(This is further discussed in chapter 5, Defining historic plaster.)*

Again, because waviness is relatively consistent, it can be recognised and surveyed. *(See Chapters 7 and 8)*.

4.13 Overview

This is a necessarily complex chapter because it has sought to cover the wide range of materials and techniques that could have be employed in medieval church plastering in Dorset.

In practice, this theoretical complexity was not encountered in the field. The survey did not encounter a significant variety of materials and techniques in the medieval plaster of Dorset churches. Indeed it is the consistent quality and consistent simplicity of the lime sand mixes used by these medieval craftsmen that allows medieval work to be visually identified with reasonable certainty.

5. Defining historic plaster

5.1 Introduction

Chapter 4 attempted to define plaster in general. This chapter details the features of medieval church plaster that allow it to be differentiated from nineteenth century restoration or modern plaster.

The project has not been able to identify any published source that discusses, in detail, the distinctive attributes of medieval church plaster. The discussions below must therefore be based on personal observations, data gathered by this survey, and the observations of specialist architects.

In seeking to define the qualities that differentiate medieval plaster from any other plaster, there is a severe danger of becoming enmeshed in a meaningless circular argument :

'Here is an area of plaster that has been defined by its apparently medieval stylistic features - how can it be differentiated from non-medieval plaster? - by defining its apparently medieval stylistic features...!'

What is needed is a non *a priori* method of definition. This is not straightforward, but can be addressed by a combination of approaches :

5.2 Archaeology

One of the key logical tools used by archaeologists is the principle that archaeological deposits build up as a series of layers, so that the earliest material is that which is most overlaid. There is a direct equivalence between such archaeological stratigraphy and a sequence of overlaid plaster layers on a church wall. The layer closest to the substrate will be the oldest, whilst that forming the current outer surface will be the newest.

A few of the churches in the survey *(for example, Lytton Cheyney; see photographs, chapter 15)* had areas of accidental damage that revealed a clear stratigraphic sequence of plaster layers. But such small exposures do not, in themselves, fix the date of each plaster layer. They prove only that each successive layer of plaster is younger than the one it covers. Despite this caution, the survey revealed numerous examples of wavy plaster surfaces overlaid by thick, flat, Victorian plasters. No examples of the reverse sequence were observed. It is therefore reasonable to assume that, on any particular wall, wavy plaster always pre-dates any thick flat layers. Historic and documentary evidence suggests that major church restoration was generally suspended between the Henrician Reformation and the beginning of the nineteenth century *(Dickens, A.G.,1964, pp.349-350., Hill, C., 1976, pp.109-118, 190-212, 275-281.)*. Thus, if a plaster layer is covered by a Victorian one, the earlier layer is probably pre-Reformation in date. (This logic is not infallible, as church repair did not stop completely in the seventeenth and eighteenth. centuries, but it is, nevertheless, a robust argument).

5.3 Dating by reference to painted decoration

The iconography and artistic styles of church wall painting are reasonably well documented and understood. *(Tristram, E.W., 1944-, passim., Park, D., 1986, 1999, 1999-2000, passim., Cather, S., 1991, passim., Curteis, T., 1998, passim., Rouse, C.E., 1968, passim)* It is thus possible to date, fairly accurately, areas of surviving painted decoration. The murals at Loders, Puncknowle or Cerne Abbas are good examples *(RCHM, 1952, p.xiiv.)*. Since mural paintings are directly and intimately attached to their supporting plaster, it is reasonable to give the same date to the plaster as has been ascribed to the paintings. The survey found no evidence that reliably dated Pre-Reformation wall paintings were ever applied to flat ruled plaster. In other words, the dateable wall paintings in Dorset churches are always applied to wavy plaster, thus confirming that waviness is a defining attribute of medieval plaster.

5.4 Materials

When trying to date the materials used for plaster a working proposition is possible : that transport of materials was very difficult and expensive for the medieval plasterer. It follows from this proposition that medieval plasterers would use locally available materials wherever possible, even if these were not of the best available quality. This rule-of-minimum-transport can reasonably be supposed to apply more rigorously to heavier and lower value building materials, and is certainly true of the stone used to construct Dorset churches *(Thomas, J., 1993 and 1994, passim.)*. Plastering materials are also both heavy and of relatively low value. Thus, it is probable that most medieval Dorset church plasters would have been made using local materials, even if these were not the best available and indifferent quality and variability were their common and distinctive features.

National transport started to improve during the eighteenth century, with the development of the canals and the founding of the turnpike trusts *(Hadfield, C., 1974, pp.17-31., Cossons, N., 1975, chapters 13 and 14., Buchanan and Cossons, 1969, chapter 8.)*. Once this transport revolution had taken hold, and later when the railways developed, the costs of transporting building materials fell dramatically. At least in theory, specifiers could demand, and plasterers provide, consistent, uniform and high quality materials. This could be done by standardising sands and limes and concentrating lime production on large scale, coal fired kilns. In other words, there should be a clear differentiation between pre- and post industrial revolution plasters. The latter should exhibit high quality, standardised materials.

However useful this might be in theory, the ethical limitations of this project meant that little evidence of plaster composition could be gathered, for it is not possible to gather mortar samples with partially destroying the plaster being sampled. The original design of the surveyed was predicated on its being completely non-destructive, so samples were not taken. The lime, sand and additive content of the plaster in surveyed churches could only be examined where it had already been accidentally revealed. These accidental exposures did not provide sufficient evidence to justify or disprove the theory that pre- and post industrial plasters can be clearly differentiated on the basis of their material composition. There is extensive scope for further research in this area. *(See chapter 11.9.4)*

5.5 Thickness and layering

This survey has gathered a significant body of data to suggest that medieval Dorset plaster can be differentiated from later plasters by reference to its thickness and layering.
All the plasters proven to be medieval, by stratigraphic or wall painting evidence *(See above, 5.2 and 5.3),* were thinly applied, and never completely eliminated the undulations of the masonry under them. In other words, they fell within the definition of waviness discussed below *(chapter 5.8)*. On this evidence, it is reasonable to assume that thinly applied plasters are a medieval signature, and, conversely, that most very thin plasters - especially where they reveal the undulations of the substrate - are medieval.

One of the surprises to emerge from the survey data was that nineteenth church plasterers do not appear to have adhered to best practice, as detailed in texts such as Millar or Bankhart. *(Millar, W., 1897, passim.; Bankhart, G.P., 1908, passim.)* The rules of good workmanship then dictated that very thick layers of plaster should not be created in-one-pass, but should be built up in thinner layers *(see chapter 4.3)*. Numerous churches included in the survey displayed nineteenth and twentieth century plaster applied in exceptionally thick single layers.

In one respect medieval and nineteenth century practice does not appear to have differed. Both medieval and nineteenth century plasters were generally found to have been finished with a skim coat of lime containing only small amounts of aggregate. (Once again it should be noted that this data is derived from observation of accidental damage. No samples were deliberately taken.) This commonality of working practice has not led to any confusion in the dating of the underlying plaster.

5.6 Relationship to architectural detail

Many of the architects specialising in the repair of historic churches in this country are agreed that medieval plasterers rarely produced sharp stops *(see glossary)* at the edges of their work. *(see photographs, Lytton Cheyney, chapter 15, on CD) (Schofield, J., 1984-2002, pers.coms., Hadlington, M., 2004, pers.com., Ratcliffe, T., 1996-8, pers.coms.)* Such stop details are very much part of nineteenth and twentieth century architects' vocabulary. Medieval plasterers appear to have always feather-edged their work. For example, where a plaster surface was brought towards a sharp arris *(see glossary),* such as the outer edge of a window reveal, it was made to gradually diminish in thickness, and run-out to nothing as it approached the arris *(see photographs, Winterbourne Steepleton, chapter 15, on CD).*

The change of style between medieval work and nineteenth century restoration work is so marked in this area that it is again reasonable to assume that plaster with feathered edges is probably medieval.

5.7 Surface texture

Texture in this context means the exposure of aggregate grains on the surface of the plaster, or the gouging of the plaster surface by large aggregate grains that have been displaced during the plastering process.

No useful comparative data was collected by the survey on the surface textures of medieval or later mortars. Most of the surfaces, in most of the churches, carried thick accumulations of decorative paint. These paint layers obscured the surface texture of the plaster itself. Despite this general caution, the evidence gleaned from a small number of accidental exposures, gives grounds for suspecting that medieval surfaces are generally smoother than those of nineteenth century restoration plaster.

5.8 Surface waviness

As noted throughout this thesis, the key identifier - ***the defining feature*** - of medieval church plaster is the fact that its surface is smooth textured but wavy.

Given favourable light and an experienced guide, this waviness is easy to see :

Figure 30
Whitcombe : very wavy plaster on north wall of nave, revealed but not measured by oblique light.

But waviness is much harder to define objectively, using words. *(chapter 7.5)*. It is possible to produce a workable definition of wavy plaster solely by photographing it in favourable light, because it is the visual quality of the wavy surface that defines medieval plaster more succinctly than any other factor. To try and further define these images in words is something of a fool's errand. Pevsners' *Buildings of England (Dorset) (Pevsner, N., 1972, passim.)* is a powerful illustration of this issue. His written descriptions of buildings are almost impossible to visualise off the page. His words do not sensibly convey the data that is implicit in a good photograph of a building. The same is true of the data on wavy plaster gathered by this survey.

Despite the comment above, it is appreciated that the interpretation of photographic evidence is a skill that has to be learned. So to supplement and reinforce the definition of waviness provided through photographs, measured profiles were taken at Whitcombe. The results are fully reported and discussed in *chapter 7.5.2.3.*

The data produced by the profile survey are useful, and any future project should seek to generate more such data. But in some ways they are a diversion. The purpose of the project was to record the survival of medieval plaster. If such plaster can be recognised by its surface qualities and profile, and recorded photographically, any additional means of definition must be evaluated carefully for its costs and benefits.

However waviness is recorded, it must be noted that it is very varied in character. It ranges from surfaces so undulating that they hardly represent more than full pointing *(see glossary)*, to surfaces that have only the shallowest of wavelets. Some churches (for example, Whitcombe contains both extremes in close proximity). *(Refer to the photographic record in chapter 15, on CD).*

5.9 Ancient or incompetent ?

A question that has haunted this author, throughout the project.

Is it possible to reliably differentiate between :

- wavy plaster that was produced by skilled medieval plasterers who did not want it to be ruled flat,

and

- the work of modern repairers who could not get the plaster flat even if they wanted to ?"

This is a hard question. Identification of a style of plaster surface does not, in itself, give a definite age for that plaster.

However, the results of the survey suggest that incompetent modern repairs are usually fairly easy to recognise, and that there are often other clues that can help identify modern plaster. Repairs carried out in OPC, for example, are often easy to recognise by colour (grey) and texture (hard with crisp edged surface irregularities). In general, all the natural cements and OPC mixes set with a rapidity that precludes the attainment of a medieval style finish.

5.10 Correlation with documentary source data.

As discussed elsewhere in this thesis *(chapters 3.6 and 11.9)* this project has not undertaken large scale documentary research into the survival of historic church plaster. The preliminary work that has been done strongly suggests that records do exist that could help to positively date plaster restorations and repairs.

It is much less likely that any useful Pre-Reformation records exist, but until research is attempted, it is impossible to be certain.

6. The importance of historic plaster

6.1 Introduction

The aim of this chapter is to provide an intellectual justification for the study of historic plaster, and to fix that study within the broader framework of building conservation. It fits here, within the structure of the thesis, because justification of the study of historic plaster is not possible until historic plaster itself has been defined *(See chapters 4 and 5.)*, and the introductory mechanics of the thesis are in place.

On the witness stand in 1919, when suing his local newspaper, Henry Ford (a car manufacturer) observed that :

> *"History is bunk" (Cohen and Cohen, 1960, p.161).*

Whilst this is a commanding statement from an otherwise clever and perceptive man, it is not a widely held view. Nor is it a sensible one.

The aim of this chapter is to demonstrate that history is both important and popular, and that historic church plaster is part of this importance and deserves a share of this popularity. This is an enormous task. The scale and complexity of human efforts to understand, use and value history can only be slightly touched on in this small space. This chapter should be viewed for what it is : a beginning, not a complete review.

6.2 The general importance of history

At a most basic and universal level, our civilisation depends on the effective communication of knowledge from one generation to the next. We cannot understand where we are going unless we know where we have been.

However, knowledge without wisdom is certainly dangerous and probably useless. We need a framework, a context, in which to interpret the knowledge of our ancestors. The shorthand name for this framework is history.

This is not to say that history gives us easy and infallible guidance for the future. Reality is not as one old saying puts it : History repeats itself because no one listens. Rather it is as another old saying has it, History never repeats itself... it rhymes. *(Anon.)*

On the world stage, for example, the causes of the Second World War lay not in the events of the late nineteen thirties but in those at the end of the First World War :

> *"The First [World] War explains the second and, in fact, caused it, in so far as one event causes another... The link between the two wars went deeper. Germany fought specifically in the Second War to reverse the verdict of the first and to destroy the settlement that followed it." (Taylor A.J.P, cited in Keegan , J., 1989, p.1)*

The First World War was itself born from the development of the great powers in Europe and their interaction with the Russian and Ottoman empires... (*Keegan, J., 1998, chapters 2 and 3, pp. 27-77).* The point here is not that study of history allows us to foretell the future. It does not. No one in 1919 could have precisely predicted the events of the Second World War by studying the nineteenth century history of Europe. However, study of that history would have provided numerous general warnings to the politicians of the nineteen twenties and nineteen thirties... they chose to ignore them. *(Johnson, P., 1983, pp. 1-48).*

In a wider context, history is not just a lesson book for warring politicians. As Lowenthal puts it :

> *"The past is everywhere. All around us lie features which, like ourselves and our thoughts, have more or less recognisable antecedents. Relics, histories, memories suffuse human experience. Each particular trace of the past ultimately perishes, but collectively they are immortal. Whether it is celebrated or rejected, attended or ignored, the past is omnipresent.". (Lowenthal, D., 1985, p. xv)*

But as he goes on to say, we are not very good at either caring for it or reading it.

> *"Now a foreign country with a booming tourist trade, the past has undergone the usual consequences of popularity. The more it is appreciated for its own sake, the less real or relevant it becomes. No longer revered or feared, the past is swallowed up by the ever expanding present; we enlarge our sense of the contemporary, at the expense of realizing its connection with the past. 'We are flooded with disposable memoranda from us to ourselves', as Boorstin puts it, but 'we are tragically inept at receiving messages from our ancestors'." (Lowenthal, D., 1985, p. xvii.)*

Lowenthal's message is that despite the dangers inherent in our manipulation of the past, it is still essential to any rational view of the future.

If the general philosophical importance of history - of knowing where we have come from - is accepted, how is it specifically relevant to church plaster? The next section attempts to address this issue.

6.3 The importance of physical history.

Why is the conservation of physical history- of, say ancient buildings- important ? The most obvious answer is that all history, as Lowenthal points out, is hard to read. The record of written history needs to be supplemented, from all available other sources, if it is to be interpreted accurately and usefully. This does not mean that the simple preservation of historic material necessarily enriches our knowledge of the past. As the unerring voice of Lowenthal again points out :

> *"Valued at first because of the ideals they projected, such relics [as buildings] then became objects of devotion and worth in their own right. They were treasured, not as representative features of the past, however, but as spectacular objects precious for their cost and rarity. They were collected because they were unique and peerless. And they were copied and imitated for the same reasons.*
> *More recently, we have come to value surviving relics not merely for their symbolic references to an ideal past and because they are scarce or sumptuous, but for three other reasons :*
> representativeness, *for recalling the typical or characteristic traits of past epochs;* congeniality, *for providing a sense of continuity or a patina of age; and* economy, *for saving energy or materials or skills that would otherwise have to spent on new structures. These motives sometimes conflict, sometimes overlap: landscapes may be valued both because they are unique and because they are familiar; buildings may warrant preservation both because they are symbolic and because they are elegant". (Lowenthal, D., and Binney, M., 1981, p. 11.)*

John Earl refines and expands Lowenthal's categories of importance :

> *"**Celebratory and magnificent**... buildings [that] from the moment of their creation, were marked out for preservation... buildings associated with the rituals of religion and power or expressive of pride in national or cultural achievement... **Rare and curious**... Buildings which do not immediately declare themselves to be deliberately created celebratory monuments can move into this class and excite interest and a desire to preserve as if they were monuments in a more formal sense... Most obviously, the simple fact of survival... may make a building an object of rarity or curiosity. Stonehenge was regarded with awe long before its significance began to be understood. **Commemorative and associative**... Historical associations can also promote a comparatively modest or utilitarian building to the status of a revered monument. **Exemplary or instructive**... All old buildings can be studied for what they reveal about the past but historically, architectural exemplars were amongst the first to be singled out in this way. **Pleasing and picturesque**... Ruins, in particular, were preserved (even, at times, newly built) as picturesque objects, to beautify a view and endow a landscape with a pleasing flavour of antiquity." (Earl, J., 2001, pp. 11-25.)*

If Lowenthal and Earl are at pains to point out the complexity of the case for the importance of cultural heritage, not all commentators are so worried. UNESCO, for example, states :

> *"The cultural heritage may be defined as the entire corpus of material signs - either artistic or symbolic - handed on by the past to each culture and, therefore, to the whole of mankind. As a constituent part of the affirmation and enrichment of cultural identities, as a legacy belonging to all humankind, the cultural heritage gives each particular place its recognisable features and is the storehouse of human experience. The preservation and presentation of the cultural heritage are therefore a [sic] corner-stone of any cultural policy". (Jokilehto, J., 1999, p.1.)*

In short : the general answer to the question "why is historic church plaster important and worthy of study?" is *because our history is important and valuable and that history is the sum of all its tiny and diverse parts.*

6.4 Conflicts of interest

If commentators broadly agree over the importance of physical history, this consensus becomes somewhat strained when principles are applied at a practical level. In this country, there is considerable dispute about which parts of the physical historical environment are more important than others.

Humphrey Welfare, lately of English Heritage, in his introduction to papers from a conference on vernacular architecture, declares :

> *"Small buildings in their infinite variety, constitute a core part of the historic environment...*
> *The familiar and comfortable forms of vernacular buildings are indissoluble from perceptions of regional character and from the spirit of place of villages, market towns and scattered rural communities. They are thus an integral part of our cultural consciousness..." (Pearson and Meeson, 2001, p. xiii.)*

In the circumstances of such a conference, the remarks are not surprising. But who agrees with this noble statement on the equality of ancient buildings? It is very doubtful that those responsible, within English Heritage, for castles or cathedrals think that their buildings are only of equal importance to a country cottage or a group of town houses. Historically, both English Heritage and the National Trust have concentrated overwhelmingly on grand buildings to the near complete exclusion of vernacular architecture. The very large financial commitment made recently by the National Trust and the Heritage Lottery Fund to purchase Tyntesfield is an excellent example of the way resource is skewed towards large and grandiloquent buildings.

6.5 Conservation of the whole versus defining important material

For many years building conservation has tended to ascribe importance almost exclusively to the

surface of historic material. In recent years, however, a more holistic approach has started to emerge, though there is still enormous scope for more research into how construction and appearance can be conserved. This is highly significant to any debate on the importance of historic plaster. Three areas of conservation have so far generated significant debate on this issue :

6.5.1 Lead versus glass

The glass in traditional leaded light *(see glossary, chapter 13.6)* church windows has attracted very considerable artistic interest and conservation effort, but in recent years the historic importance of the other materials involved has also been recognised. In particular, the lead cames that hold the glass in place have been accorded significant conservation effort in their own right. *(Channer, J., 1985 onwards, pers.coms., Clare, S., 1995 onwards, pers.coms.)*

6.5.2 Iron versus stone

Very similar changes of attitude to those expressed in glass conservation have also been voiced in the world of stone conservation. Up to the middle of the nineteen nineties it was normal for stone conservators to discard any medieval iron reinforcement found inside stone structures, and to replace it with stainless steel or bronze. Following the circulation of a discussion paper by English Heritage, there has been a significant change of attitude towards recognition that all parts of a historic structure are worthy of conservation *(Martin, B., undated, unpublished consultation document, passim.).*

6.5.3 Paint versus plaster

Until recently, church plaster was seen merely as a support for significant wall paintings, and not as historically important in its own right. The damage to plaster done in the name of archaeology bears witness to this *(see chapter 14.6.3.5 for a further discussion of this issue).* It is not certain how far this attitude has yet changed, but it is likely that the changing attitudes in other branches of conservation will also influence wall painting conservators and even archaeologists.

6.6 Conclusions

There are many ways of defining the importance of physical history. The major manifestos (such as the Athens or Burra charters, or the SPAB Manifesto *(Morris, W., 1877, see* *chapter 14.)* all differ significantly in detail and emphasis... but all agree on the basic point that physical history is an integral and vital part of our culture.

> *"For what is left [of our built heritage] we plead before our architects themselves, before the official guardians of buildings, and before the public generally, and we pray them to remember how much is gone of the religion, thought and manners of time past, never by almost universal consent to be Restored; and to consider whether it is possible to Restore those buildings, the living spirit of which, it cannot be too often repeated, was an inseparable part of that religion and thought, and those past manners." (Morris, W., 1877)*

Some parts of our cultural heritage are clearly more significant than others. It is the skill of Titian the painter that excites our interest, not the skill of the unknown forester that cut the wood for his frames. This does not, however, mean that only the most interesting parts of cultural material have value. It is becoming increasingly recognised that it is not possible to cherry pick the important parts of cultural history. The whole is interdependent. Church plaster is as valuable a part of church history as any other aspect of church decoration.

7. Survey results

7.1 Introduction

The project has sought to define the historical, physical, and social reasons for the survival of church plaster in Dorset churches, but the primary aim has always been to address the basic lack of data on the *extent* of survival. This chapter reviews the practical issues generated by the survey process and presents an overview of issues presented by the data . The survey data is analysed in *chapter 8,* and presented in detail in *chapter 12.*

7.2 Survey objectives

To fulfil the aims of the project, the field survey pursued the following seven objectives :

i To record the plaster in as many Dorset churches as time and money restrictions would allow

ii To examine the edges of all existing plaster for signs of older layers that have been overskimmed. *(see glossary)*

iii To examine all existing plaster and note any areas whose surface finish might suggest that it was pre Victorian in date, using the concept of waviness *(see definition of waviness, chapter 5).*

iv To create an organised record of the survey results *(see chapter 15).*

v To analyse the data gathered by the survey to determine which factors influence the survival of old plaster, and whether any factors exist that would allow the likelihood of plaster survival to be predicted.

vi To define the reliability of visual survey for old plaster by creating a photographic record that can be re-analysed using more objective survey techniques.

vii To explore the concept of waviness to facilitate objective comparison of different plaster finishes.

It should be stressed that the survey was designed to be entirely non-destructive and thus did not involve the collection and analysis of any material samples. Collection of samples would have required an elaborate exercise in permission seeking which would have severely restricted the number of churches surveyed.

7.3 Methodology of survey

7.3.1 Definition of Dorset

Preliminary research *(DRO Staff, 1999, pers.com.)* suggested that there was no available definition of the County of Dorset that could be accepted as universal. From both a topographical and architectural point of view, even long standing portions of the Dorset boundary are anomalous. In particular, the border between Dorset and Somerset rarely follows any significant landscape feature, and many of the churches fit better with the architectural tradition on the other side of the county line.

Since the project needed a definition of Dorset, however arbitrary, it was decided to follow the boundary definition used by Nikolaus Pevsner for the Dorset volume of *The Buildings of England. (Pevsner, N., 1972, p. 2-3.)* Essentially this means that the pre-1972 civil borders of Dorset have been followed.

7.3.2 Definition of medieval

The survey takes a very broad definition of the medieval period. Churches included in the survey were built from the Christian Saxon period (c.890 AD) to the beginning of the Henrician Reformation (1531). Whilst neither of these dates is positively associated with any particular Dorset church plaster, the lack of precision has made no difference to the practical organisation of the survey. There are no churches in Dorset that would be included or excluded as a result of a more precise definition of the start date of Christian church building in Dorset. (Whether any Saxon wall plaster survives in Dorset is an unanswered question, that begs further research.)

At the other end of the defined period, (that is, after the start of Henry VIII's Reformation) there were no churches where the survey cut-off date raised any critical issues. Throughout the text, any reference to old plaster means that it falls within the date range given above, that is, 890 AD to 1531 AD.

7.3.3 Definition of a church

Just as the question, what is Dorset, is less simple than it first appears, so also is the definition of a church. For this survey the following criteria have been adopted :

7.3.3.1 Monastic buildings

No monastic buildings are included. Examples are Fforde Abbey, or Sherborne Abbey. No buildings that are currently ruined are included. Thus the former consecrated parts of castles such as Corfe and Sherborne, and the remains of the church at Stanton St. Gabriel are excluded. However, significant parts of structure such as the surviving tower at Compton Abbas Old Church are included. The logic here being that structures surviving to roof level and still possessing partial roof coverage are not ruins but fragments.

7.3.3.2 Post-Reformation buildings

No Post-Reformation buildings are included. Post-Reformation buildings are here defined as buildings that contain no structural elements from before the Henrician Reformation. Though this would appear to be a simple definition, it is fraught with complication. How, for example, should reused material be treated? In practice, such theoretical difficulties did not interfere significantly with the conduct of the survey.

7.3.3.3 Private chapels

Private chapels, or medieval church buildings currently in private use, are not included.

7.3.3.4 Non-conformist chapels and churches

The definitions above automatically exclude all non-conformist chapels, since all are Post-Reformation. Some, particularly United Reformed Church, Baptist and Quaker chapels could possibly contain pre-Victorian plaster, but that is an area for further research.

***7.3.4 Limitations of sample** (See also chapter 3.)*

The definitions of Dorset and of a church represent the deliberate parameters imposed to contain the scope of the survey. The following points list the involuntary practical limitations under which the survey operated :

7.3.4.1 Resources

The survey was restricted in scope by shortage of time and money. Whilst Dorset was chosen deliberately for its ease of access, compact area and moderate concentration of churches, the field survey still proved to be an enormous task. With the gift of hindsight, a smaller number of churches in a more compact area should have been chosen. This would still have produced interesting results and would have greatly reduced the costs of the project. It is estimated that the project has cost nearly £2,500 in travel, photography and incidental expenses. This figure does not include any allowance for time, or for the efforts of the numerous people who assisted with the fieldwork.

7.3.4.2 Random exclusion

Eight eligible churches *(See below, chapter 7.3.4.4.)* have not been surveyed, even though they were not excluded by any of the criteria given in this section. The reason has been primarily the prohibitive cost of making return visits when a church was found to be inaccessible on the first attempt. Since these churches were not surveyed, it is naturally impossible to assess how significantly the survey results have been impacted.

7.3.4.3 General limitations of the survey

All survey work was done from ground level. Only open public access areas were entered. Sanctuaries were not entered where an altar rail was in place and was closed. No roof spaces were entered. No upper floors were accessed, except for west galleries. No furniture was moved. Curtains, where obviously moveable and in good condition, were temporarily moved when this facilitated inspection of wall plaster. No samples or scrapes of any sort were taken. Installed, fixed artificial lighting was only used where there was an obvious written invitation to do so.

7.3.4.4 Access

Rural Dorset churches are not generally locked during daylight hours. However, there were a substantial number of exceptions. In some cases, instructions were followed, and a local key-holder was located, but where no data is noted on the attached maps and tables, the cause is that it proved impractical to gain access. This was substantially more of a problem during the resurvey of churches found to have old plaster. No obvious explanation can be given for the increase in locked churches between the early and late stages of the survey. There is, perhaps, fertile ground here for further research.

7.3.4.5 Light

The accuracy and scope of the initial phase of the survey was frequently affected by poor lighting conditions. Where churches (for example, Maiden Newton) were re-visited during the initial survey, improved lighting on the second visit invariably suggested the presence of more old plaster than had been observed on the first visit. This is not surprising. Much old plaster is located in darker areas (for example, above the tower arch at Upwey) and waviness shows up visually because of the contrasts of light and shade that it creates. No light means no shade !

7.3.4.6 Objectivity and interpretation

Throughout, the survey has been limited by the subjectivity of the data gathering process. No two people are likely to see quite the same areas of waviness when looking at a church interior. Strenuous efforts were made throughout to minimise this problem. Wherever possible surveying was done with a team of at least two people. Where possible innocent bystanders were cajoled into accompanying the author in order to pour the dispassionate scorn that can only be delivered by the non-involved. This consultative approach yielded many spirited discussions. Where agreement could not be reached, the survey result was recorded as no old plaster. In acknowledgement of the subjectivity of the survey, a sample of 10 churches, chosen randomly from the first survey, were re-visited and re-surveyed. This quality control sample was in addition to revisits done as an integral part of the main survey. No significant corrections were found to be needed. This was particularly encouraging because there was a suspicion that poor weather had occasionally chilled the author beyond his ability to function reliably. Chapters 9 and 10 of this project deal in detail with possible methods for making the survey of old plaster more reliable and more objective.

7.3.4.7 'Fame'

This survey has not concentrated on the known famous examples of painted plaster, (for example, at Wareham, Tarrant Crawford or Puddletown) precisely because they are well known and would not add new knowledge to the survey. Puncknowle, Cranborne, Loders and Whitcombe did receive substantial survey effort because they were recorded in secondary sources as having painted plaster, but those records were not extensive. *(Pevsner, N., 1972, passim., RCHM, 1952-1975, passim.)*

7.3.5 ***Avoidance of preconceptions*** *(See also Chapter 3.)*

Preliminary site visits, before the start of the project, suggested the most accessibly organised gazetteer was the Dorset volume of *The Buildings of England (Pevsner, N., 1972)*. As noted in the introduction to this project *(chapter 2)*, Pevsner had a personal set of interests in church architecture and decoration. Plaster was clearly not one of these, so the *Buildings of England* has been invaluable as a general gazetteer, but of limited value in other respects. A particular problem is Pevsner's ability to make comment appear well observed and accurate, even when it is over-generalised and ill-informed. A recurrent problem has been his failure to observe that the outer leaf of a medieval wall has been rebuilt when the inner leaf has remained undisturbed. For example, the entry of Owermoigne reads,

> *"St. Michael. 1883 by S. Jackson of Weymouth. Cost £756 (Ferriday Index). Only some odd features (chancel N window) true Perp. ..." (Pevsner, N, 1972, p. 309)*

Whilst it is obviously true that much of the exterior of the church is Victorian, a brief examination of the nave interior has revealed a distinct possibility of old plaster.

Because of this known potential for the generalised dismissal of churches as wholly Victorian, great pains have been taken to avoid approaching any of the surveyed churches with preconceptions about their antiquity. Neither Pevsner, nor any other source, has been used to assess the possibility of plaster survival a before a church has been surveyed. Again to avoid generation of preconceptions, no documentary sources have been consulted until after the physical survey has been completed.

7.3.6 ***Correlation with architects records*** *(See also Chapter 3.)*

It is known that a substantial archive of plans, specifications and letters from the Dorchester based architect Crickmay are kept in the Dorset Record Office. Although this archive is undoubtedly a valuable tool for throwing light on the specification and supervision process that lay behind Victorian restoration, consultation with Record Office staff *(DRO Staff, 1999, pers.coms.)* suggested that the material is very extensive *and* poorly organised. Its indexing and correlation to as-built work would be a doctoral thesis in its own right. It was regretfully left to be examined another day.

Aside from the Crickmay archive, it is likely that many more restoration plans and supervision documents exist in the private archives of architectural practices, record offices in other areas and in the archives of the Royal Institute of British Architects, the Society for the Protection of Ancient Buildings and the Victorian Society.

There is a need for great caution when assessing the material in architects' archives. It would sometimes appear that architects sincerely believe that their designs and instructions are always accurately reproduced by builders. Having worked on ancient buildings, as a contractor, for nearly 20 years, the author's direct personal experience suggests that there is often a wide gulf between the architects' proposal, and the as-built result. This was a significant factor in the decision to concentrate the latter part of the project on objective survey methods rather than documentary research.

7.4 Methodology modifications during the survey

The survey produced two real surprises.

The first was the extent of plaster survival, which is further discussed in chapters 8 and 14.6.

The second surprise was the extent to which medieval plaster had been overskimmed by later plaster. The experience of earlier survey work in Somerset *(see Preface, chapter 1)* had suggested that some evidence of overskimming might well be found, but the project was not prepared for the amount that was actually identified. This lead directly to the modification of the project to incorporate at review of possible ways of seeing through the overskim. *(See chapters 9 and 10.)*

7.5 Survey techniques

7.5.1 General introduction

Data was recorded in the field on record sheets. These are partially reproduced in transcript in chapter 12.18.

The results of the survey field data sheets have been presented as tables, graphs and maps, as appropriate. Keys and explanations are included with each table.

Maps are sketched from the Ordnance Survey one inch = one mile, first edition, and are not to exact scale.

The first phase of the survey covered 210 churches, chosen as described above and in chapter 3.

The second phase of survey involved the rechecking, and photographic recording in detail of 18 churches chosen on the following criteria :

i Churches that appeared, from the first survey, to retain medieval plaster.

ii Churches that retain obvious visual evidence of painted plaster.

iii Churches that showed visual evidence of nineteenth century plaster applied over the top of earlier plaster, in other words, an overskim.

The churches chosen were :

Abbotsbury, Cerne Abbas, Cranborne, Hillfield, Knowlton, Langton Herring, Litton Cheyney, Long Bredy, Loders, Pilsdon, Puncknowle, Upwey, Warmwell, West Knighton, Whitcombe, WinfrithNewburgh, Winterbourne Martin and Winterbourne Steepleton

7.5.2 Recording wavy plaster

7.5.2.1 Introduction

Since the core activity of this project has been to find and record old plaster by identifying and defining the wavy surface produced by medieval plasterers, it is necessary to discuss in detail the merits of the recording techniques used.

7.5.2.2 Digital photography

The primary tool used to record wavy plaster has been digital photography. This has a number of advantages :

i It is cheap, easily available and simple to use in the field. Its problems and limitations are also well understood by most non-specialist audiences. In other words, an art historian, physicist, churchwarden, architect or builder will all have some chance of correctly interpreting the results.

ii It allows the rapid capture of data in adverse conditions. It is largely unaffected by temperature or humidity, and so overcomes the problems posed when physical conditions militate against a human surveyor being able to perform effectively. Many of the churches included in the survey were visited during bitterly cold conditions that would have made any form of drawn survey very difficult.

iii It offers scope for image manipulation, which can allow better interpretation of the results.

iv It automatically captures additional information that can help with interpretation. This is particularly valuable because it links the recorded area to adjacent physical details such as windows and doors. This linkage allows the observer to judge if adjacent architectural features have had an impact on the surface quality of the plaster.

v It allows the remote survey of areas that are difficult to access physically, vi Most importantly, it automatically records the presence of dirt on the plaster surface. The importance of dirt cannot be overestimated. Dirt highlights and emphasises the undulations of a plaster surface. Surfaces that deviate forwards and outwards from the general profile of the plaster attract more dirt than those that are undercut and inward leaning. The basic mechanism is simple. Most dirt in churches is in the form of particulate solids such as skin scales or candle smoke, and this material descends onto any projecting surface under the influence of gravity. The power of visual magnification of the waviness of plaster that is provided by dirt accumulation cannot be overstressed.

Against these advantages there are some serious disadvantages :

i Because photographs and drawings are so widely used, it is tempting to assume that they can be read and understood by everyone. Yet the evidence for this assumption is ambivalent at best. The author's own experience of using photographs as a teaching tool, suggests that they pose severe perceptual problems to many people.

ii It is not usually possible to directly compare one image with another because there are no common reference points or units of measurement. In other words, the data contained in one photograph is particular to that photograph and cannot be fully objectively compared with the data in any other photograph.

iii Adverse lighting conditions. For example, diffused, shadow free, light at Abbotsbury made wavy plaster at window head level in the north nave very hard to identify. Cranborne and West Knighton were challenging for the opposite reason . Although these surveys were undertaken on a bright day, the interiors were exceptionally dark. All the survey photos have a very grainy quality because they have had to be electronically enhanced after being taken in near darkness. Even with electronic enhancement, the problem of poor lighting conditions remains a severe constraint on the effectiveness of photographic survey.

iv Oblique lighting. Plaster at Abbotsbury, in the north east aisle was luckily photographed in strong oblique sunlight. This revealed the waviness of the plaster to the maximum advantage. However, the coincidence of ideal timing, orientation, glazing and weather was quite rare during the survey as a whole. A possible tool for future survey work would be an artificial oblique light source.

To sum up, digital photography, without artificial lighting of any sort, has produced a useful record of the plaster surveyed, at minimum cost. It is hard to see how the data could have been gathered any more quickly and effectively. These are very powerful arguments, within the context of this project, as one of the key aims was to develop a *practical* method of surveying for old plaster.

7.5.2.3 Measured profiles

7.5.2.3.1 Aim of the trial

To address the limitations inherent in photographic recording *(discussed above)*, a trial was conducted to assess the potential utility of measured profiling as a way of defining and recording the waviness of plaster surfaces.

7.5.2.3.2 Trial methodology

A series of one metre long profiles were taken across areas of wall with widely differing plaster surfaces, to establish if useful comparative data could be captured and displayed. The relatively short length of each profile is justified by :

i the limitations of available survey equipment *(see below)* ii the need to present the data effectively within the medium of this thesis. Longer profiles would have generated presentational problems

iii lack of utility. The visual and photographic data collected by the wider survey strongly suggested that nothing would be gained by establishing very long profiles : the waviness of a plaster surface could be defined within one metre and extension of the profile would not yield extra significant data.

7.5.2.3.3 Choice of trial site

Whitcombe church was chosen for the trial for the following reasons :

i The central section of the north nave wall carries some the best preserved medieval wall paintings in Dorset. Since the paintings are definitely medieval, that is between 890 and 1531, the plaster carrying them must also be original medieval work.

ii The relatively flat surface of the painted plaster on the north nave wall contrasts strongly with the very wavy plaster in much of the rest of the church, so that this one building defines the range of waviness encountered in Dorset churches.

iii The church also contains areas of nineteenth century overskim plaster that have a surface typical of the overskims found widely in other Dorset churches.

7.5.2.3.4 Equipment used

A one metre long rigid aluminium survey staff, graduated at one cm. intervals was mounted on a tripod supported from the floor of the church. The tripod head allowed the staff to be oriented either vertically or horizontally.

A sliding block was mounted on the survey staff and this was used to carry a laser distance measurer. This was a Leica Disto.

The equipment allowed a series of 100 right angled offset measurements from the staff to the surface of the plaster to be taken, with each offset taken at a known distance along the staff.

The accuracy of the measurements taken depended on three factors :

i The rigidity of the staff and tripod. These were selected for their rugged construction, but it is possible that random deflection did occur during the measuring process. It is not possible to estimate the extent of any errors introduced from this cause. Regular checks were made to ensure that the whole apparatus had not moved during each series of measurements.

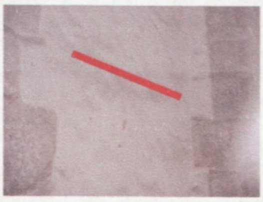
ii The precision of the sliding block mount upon the graduated staff. Even small inaccuracies in maintaining a right-angle between each offset and the axis of the graduated staff will have introduced significant errors into the profile results. Every care was taken to adjust the equipment to minimise such errors, but it is likely that some inaccuracy was introduced by this issue.

iii The accuracy of the laser distance measurer. This is an expensive piece of professional survey equipment, not to be compared to the cheap DIY equipment now widely available. Leica, the manufacturer, claim an accuracy of ± 3 mm. over a distance of 300 metres. For the purpose of this trial, the Disto was calibrated against a 3 metre steel tape and found to produce no visually discernable errors.

7.5.2.3.5 Location of profiles

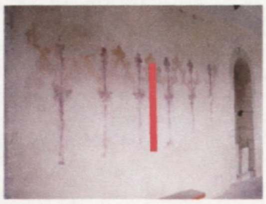
Profiles were numbered A to F, and were located as indicated in the following figures. The locations were not random, but were deliberately chosen as exemplars of different types of plaster surface.

Figure 31. Location of the measured profiles



Profile A

Profile B

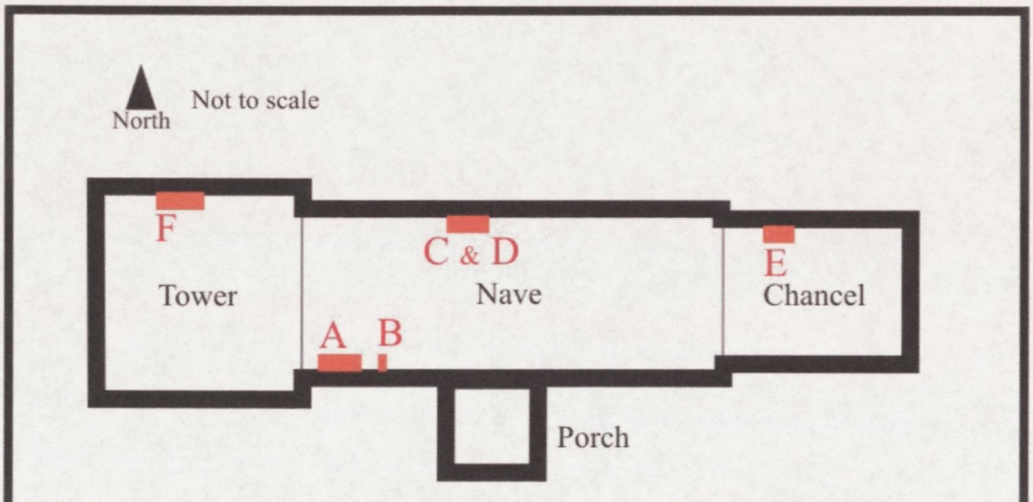


Profile C

Profile D

Profile E

Profile F



Whitcombe : location sketch of measured profiles

7.5.2.3.6 Profile data presentation

Since the trial involved the creation of a limited number of profiles that are all discussed in detail below, the data is presented here rather than in the maps and tables section of this thesis.

7.5.2.3.7 Profile results :

All the profiles are directly comparable, one with another.

The horizontal scales *(x-axis)* on all the profiles use the same intervals.

The vertical scales *(y-axis)* on all the profiles have differing origins, but do use the same intervals.

The differences in origin for the vertical scales *(y-axis)* reflect the varying distance from the measuring equipment to the surface of the plaster. This difference in separation between the plaster surface and the measuring equipment does not affect the direct comparability of the profiles.

The relative scales of the x and y axes mean that the texture of the surface is effectively exaggerated by 6 times. (This figure is approximate as actual dimensions on the graphs may have been slightly distorted by the publishing process.)

Plaster profile : Whitcombe A :

Horizontal profile of plaster on nave south wall adjacent to tower arch.

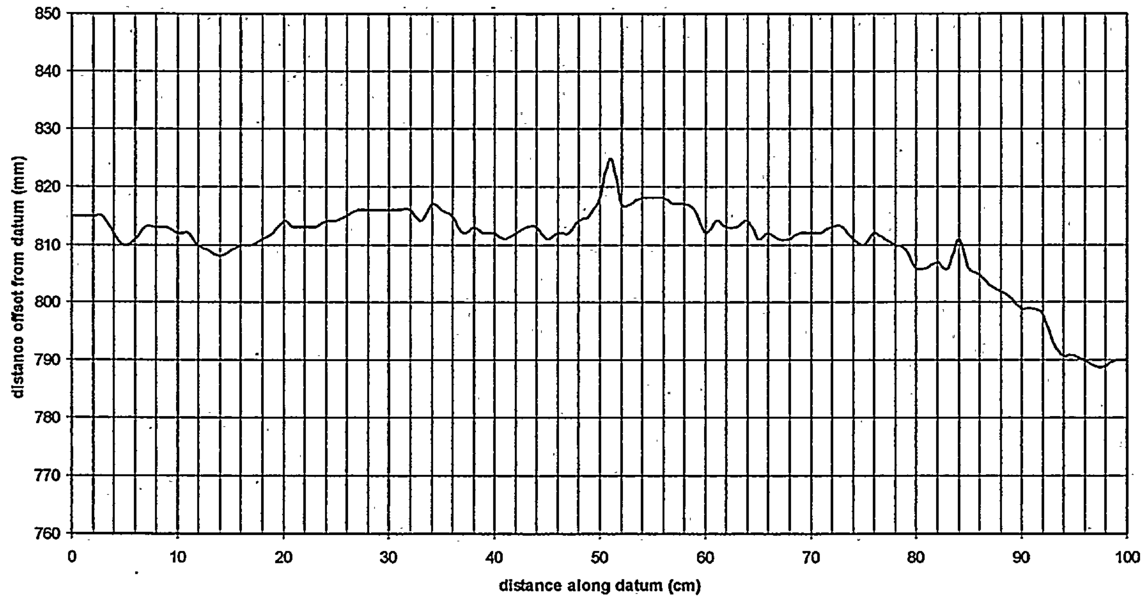


Figure 32 shows the plaster surface profile measured at position **A** at Whitcombe Church. The graph shows the separation of the plaster surface from the rigid aluminium survey staff, plotted with an arbitrary origin, against the distance along the staff. Figure 22 shows a horizontal profile of the plaster on the south wall of the nave adjacent to the tower arch. *(See location photographs and sketch plan above.)*

Two features are apparent from this profile that also apply to profiles B, C, D, E and F :

i "Noise". The entire profile has small irregularities more or less equally spread over its whole length. These are in the order of 1-4 mm. They are not without meaning. They represent the roughness of the surface caused by protruding grains of aggregate, together with random imperfections caused by initial application and and later damage to the plaster. For example the spike at 51 cm . *(x-axis)* reflects a pocket in the plaster surface, probably caused by the loss of a large aggregate grain.

ii Larger scale surface profile. Though not easily apparent from the graphed results, the profile does record a series of waves in the plaster surface. These waves occur along the *x* axis in these places : 0-14 cm., 14-44 cm., 44-97 cm.

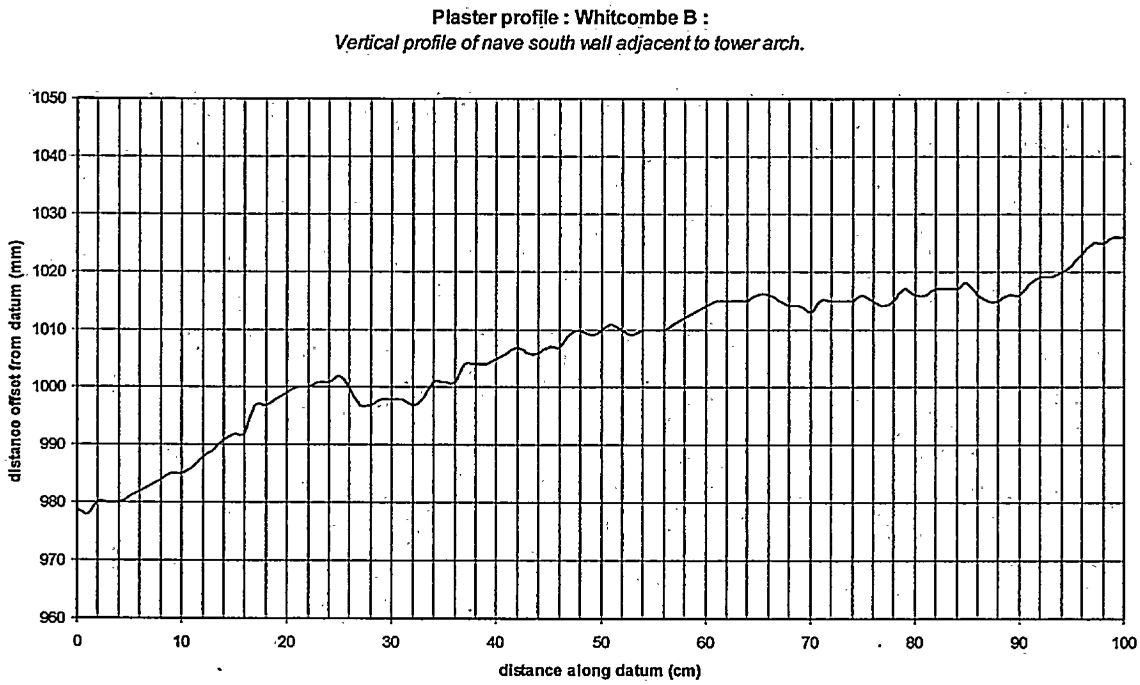


Figure 33 shows the plaster surface profile measured at position **B** at Whitcombe Church. The graph shows the separation of the plaster surface from the rigid aluminium survey staff, plotted with an arbitrary origin, against the distance along the staff.

Figure 23 shows a vertical profile of the plaster on the south wall of the nave adjacent to the tower arch. *(See location photographs and sketch plan above.)*

The profile runs upwards from left to right, that is the point of the profile nearest to the floor is represented by zero on the *x*-axis. The origin of this profile is slightly below and to the east of the origin of profile A. The profiles do not intersect. The general trend of the plaster surface away from the survey datum is because the wall surface is not vertical.

Apart from surface noise similar to that noted in the discussion of profile A, this profile again describes several waves, 0-25 cm., 25-88 cm. and 88-100 cm. along the *x*-axis. Thus in reality they are ranged vertically above each other, up the plaster surface.

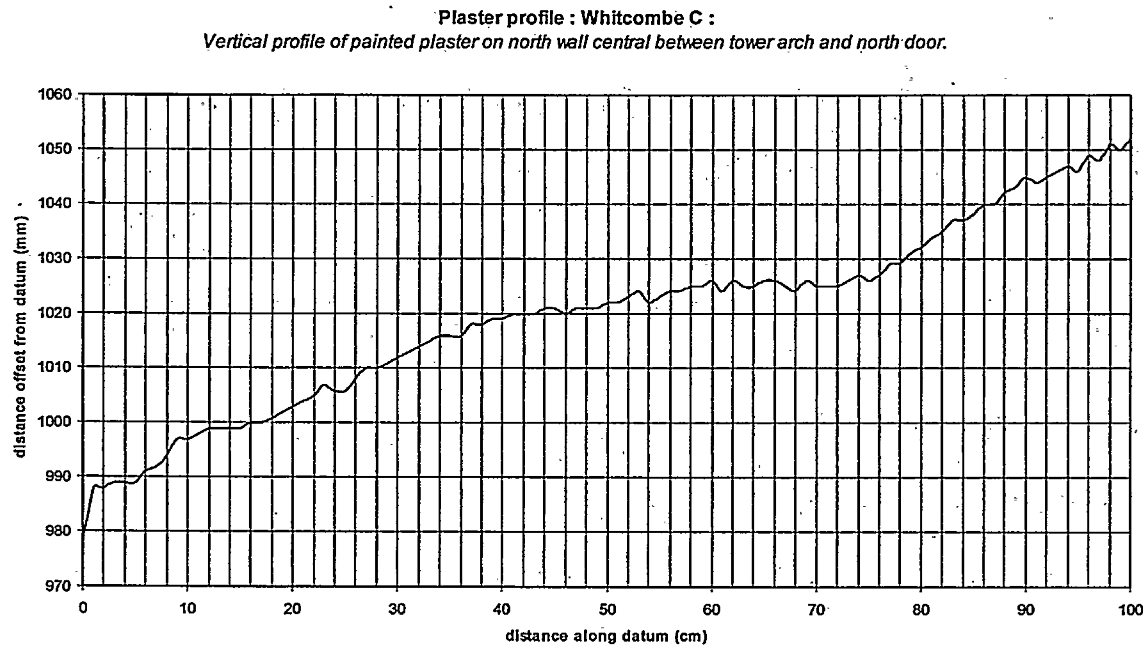


Figure 34 shows the plaster surface profile measured at position **C** at Whitcombe Church. The graph shows the separation of the plaster surface from the rigid aluminium survey staff, plotted with an arbitrary origin, against the distance along the staff.

Figure 24 shows a vertical profile of the plaster on the north wall of the nave between the tower arch and the north door. *(See location photographs and sketch plan above.)*

This profile records some of the smoothest medieval plaster noted in the survey. Not only is the waviness minimal, the surface texture is also very fine. *(See below, profile D).*

This vertical profile intersects with the horizontal profile D at the 50 cm. *(x-*axis*)* mark of both datums. Waves can be observed at 2 - 73 cm. and 73 - 100 cm. up the surface.

The sudden jump between 0 cm. and 1 cm. represents the junction between conservation plaster placed in the nineteen seventies, and the original medieval work. In other words, medieval plaster starts at 1 cm.

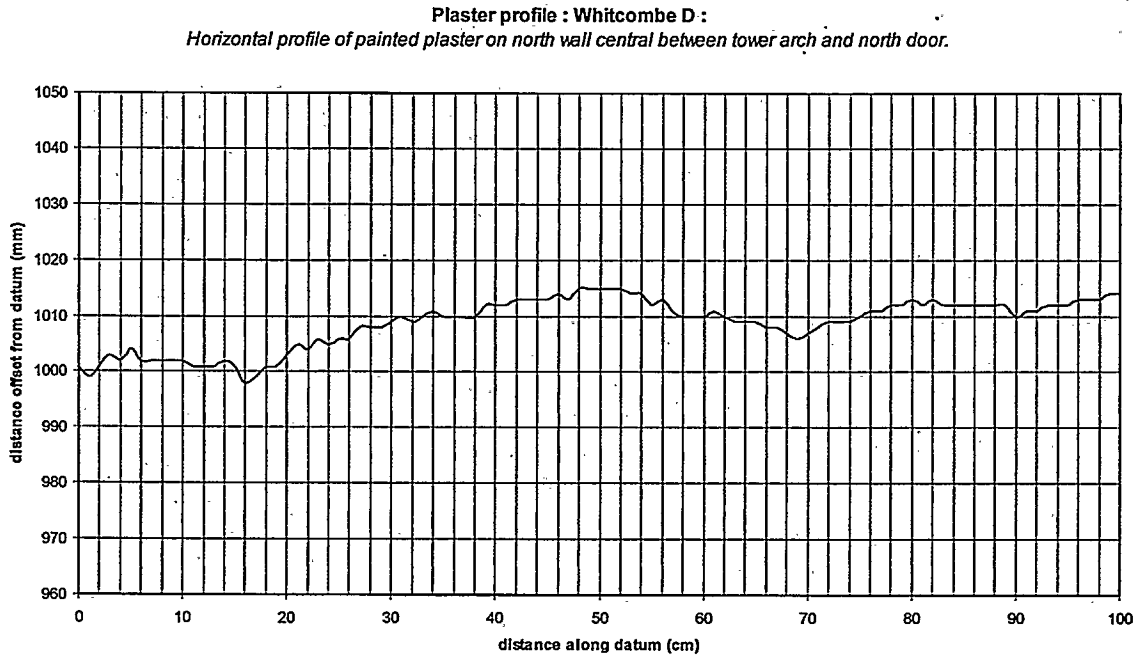


Figure 35 shows the plaster surface profile measured at position **D** at Whitcombe Church. The graph shows the separation of the plaster surface from the rigid aluminium survey staff, plotted with an arbitrary origin, against the distance along the staff.

Figure 25 shows a horizontal profile of the plaster on the north wall of the nave between the tower arch and the north door. *(See location photographs and sketch plan above.)*

This horizontal profile intersects with the vertical profile C at the 50 cm *(x-axis)* mark of both datums. Waves are visible between 0-26 cm., 26-69 cm., 69-90 cm. and 90-100 cm.

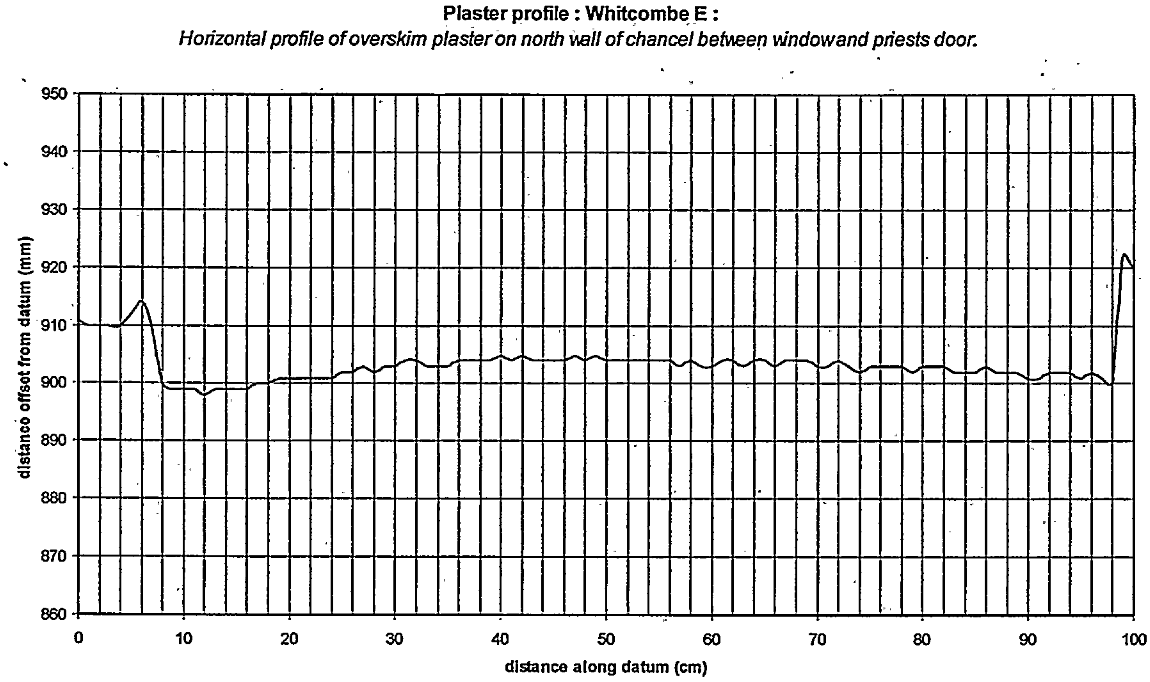


Figure 36 shows the plaster surface profile measured at position **E** at Whitcombe Church. The graph shows the separation of the plaster surface from the rigid aluminium survey staff, plotted with an arbitrary origin, against the distance along the staff.

Figure 26 shows a horizontal profile of the plaster on the north wall of the nave between the tower arch and the north door. *(See location photographs and sketch plan above.)*

Note that the surface noise has a character quite distinct from that of medieval plaster. This is almost certainly because the aggregate in the plaster mix has been pressed into the plaster surface by the use of a steel float.

The large steps at either end of the profile represent the outer edges of the overskimmed area. In other words, the overskim has been applied over, or in front of, the medieval surface and is approximately 10 mm. thick.

The slightly curved surface defined by the profile is accurate. There is a slight dish in the surface of this panel of plaster. This is interesting because it highlights how the apparent flatness of nineteenth century (and later) plasters is often not as perfect as it appears when visually observed or photographed.

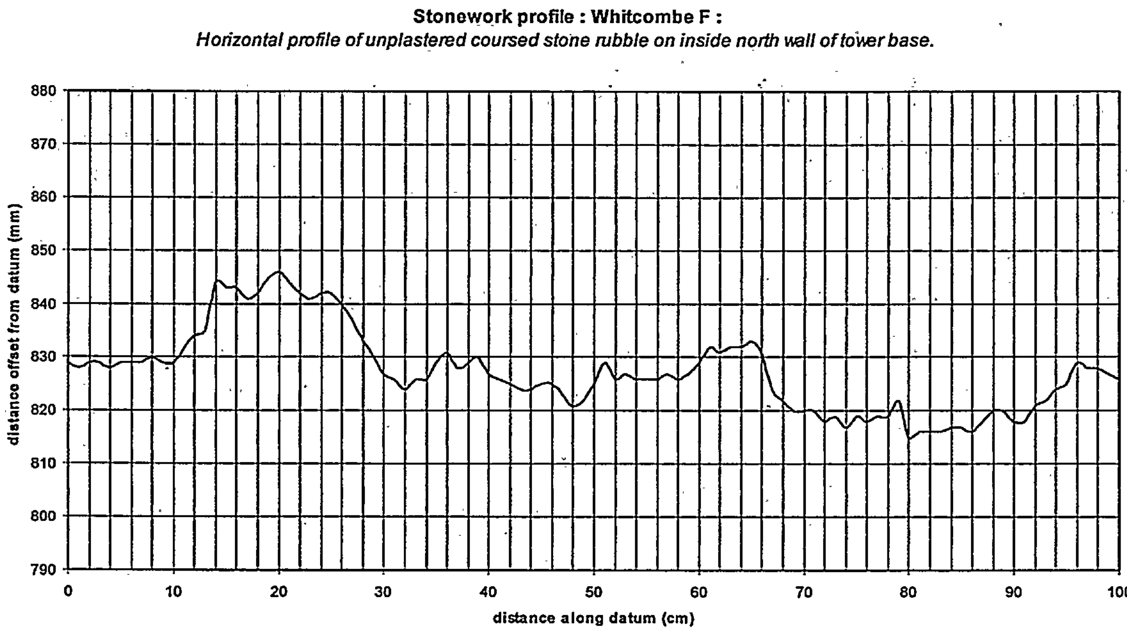


Figure 37 shows the plaster surface profile measured at position **F** at Whitcombe Church. The graph shows the separation of the plaster surface from the rigid aluminium survey staff, plotted with an arbitrary origin, against the distance along the staff.

Figure 27 shows a horizontal profile of the un-plastered rubble masonry on the interior of the north wall of the tower *(See location photographs and sketch plan above.)*

Joints between stones are represented at 14-25 cm. and 61-65 cm. along the *x*-axis. Other irregularities in the graph, for example 32-48 cm. and 64-96 cm. are generated by the surface profile of individual stones.

This profile is included as a benchmark. No significantly rougher internal surfaces were noted during the survey. Note that it is very different in character from even the roughest of the medieval plaster profiles. Thus, whilst individual values along the *x*-axis have no absolute meaning, the trace as a whole, does reflect that the wall surface is fundamentally different from either medieval or Victorian plaster.

7.5.2.3.8 Conclusions : utility of profiling

Relatively simple equipment was deployed and proved successful in gathering useful numerical data.

It is clear that a reference collection of profile data could be established. This could be used for the objective identification of plaster that was likely to be medieval. It would be straightforward to develop profiling by collecting grids of measurements that could be displayed effectively as contour surfaces using *Microsoft Xl* charts.

However, the trial did not fully establish profiling as a practical survey tool. The principle difficulty lies in the time taken to capture the data. In the case of Whitcombe, six hours were needed to produce the site data. Photographic data for the same areas was collected in under five minutes. Investment in up-to-date reflectorless total station survey technology might dramatically reduce the time taken for data capture, but such speed could only be bought at considerable cost. Reflectorless total station theodolites cost in excess of £30,000. There are also significant issues associated with the accuracy of currently available equipment. *(Wilmot, S., 2005, pers.com.)*

This trial suggests that numerical profiling would be a useful complement to digital photography as part of a better resourced survey. Even with the greatly increased resourcing, the time spent in data gathering would be substantially increased.

7.6 Results of the survey

7.6.1 Introduction

Reference should be made to chapter 15 (on the CD that accompanies this thesis) for a full photographic record of the survey.

As noted in the general introduction to this chapter, the detail survey results are presented in chapter 15. The function of this section is to give an overview of the results to underpin the analysis and discussion in chapters 8 and 14.6.

7.6.2 Overview

The survey methodology was applied to :

i 210 churches, of which

ii 38 were found to have definite survival of medieval plaster and

iii 86 were found to have evidence of plaster that was possibly medieval.

In other words, over half the surveyed churches had some evidence of medieval plaster survival.

7.6.3 Discoveries

Three real surprises were produced by the survey :

i The standard published reference sources *(that is, Pevsner, N., 1972, and RCHM, 1952-1975.)* were incomplete and unreliable in their recording of historic wall surfaces. Pevsner *(Pevsner, N., 1972, passim.)* was found to be prone to generalisations about the age of church fabric that cannot be supported from the evidence of this survey.

ii Far more medieval church plaster survived Victorian restoration than this author, or any other commentator thought likely. Put the opposite way, Victorian restorers were nowhere near as thorough as they themselves, and their historians have suggested.

iii Very substantial areas of medieval plaster survive under later overskim.

7.7 Issues generated by the survey

7.7.1 Introduction

The survey generated a variety of issues relating to the process of capture and assessment of data. Many of these were foreseen when the methodology was devised and are discussed above *(See section 7.3.)* Unexpected issues, that came to light as the survey progressed, are discussed below. They are arranged in alphabetical order since they are essentially separate, one from another, and are only connected because they were generated by one survey.

7.7.2 Assumption from stylistic features

Ascribing an age to any part of a church by association with a stylistic feature of known date is potentially dangerous. At Abbotsbury, the north nave clerestory appears, from the architectural style of the windows, to be Post-Reformation, yet the associated plaster has a typically wavy medieval appearance. Two opposing interpretations are possible :

i the wavy plaster on the arcade walls is medieval and the clerestory was modified/added later, with exceptional care being taken not to disturb existing work.

ii the plaster is post medieval work, of the same date as the clerestory windows, and has a surface finish atypical of its date.

Without recourse to archeological investigation or detailed documentary evidence, this project is unable to say more than that the plaster is *possibly* medieval.

At Hillfield, *(see photographs, chapter 15, on CD)* another issue of interpretation is presented. The western end of the north wall of the nave has a cresset stone *(see glossary)* built into it. Such stones are generally held to be medieval in origin. *(Schofield, J., 1985, pers.com.)* But can the presence of the cresset stone be used to date the masonry and plaster around it? Again two opposing interpretations are possible :

i that the cresset stone is in its original medieval position, and thus the masonry and plaster around it are likely to be undisturbed medieval work.

ii that the cresset stone was recognised by Victorian restorers as an interesting relic, and was deliberately rebuilt into a Victorian wall. Many such examples exist throughout the country such as the Norman details inside the south porch at Cranborne. *(Data derived from this survey.)*

7.7.3 Complexity and misleading evidence

This survey is necessarily based on a coarse definition of the medieval period. In reality historic plaster is not easily fitted into neat divisions of history. For example, the late medieval plaster and painting on the north wall of the nave at Whitcombe was applied onto masonry that may have been already 400 years old. Again, it is possible that the plaster on the southern window reveals at Winterbourne Steepleton is all medieval, but was done in patches over a period of 300 years. Given this vast timescale it is hardly surprising that considerable differences in waviness were observed, even within small areas of one church.

The survey has placed only limited reliance on dated plaques, inscriptions and fittings. *(Examples of these features are illustrated in chapter 15.)* Many of these features appear to be telling an honest tale, and are relevant to their immediate location, but none describe the limits of their own relevance. A hopper head *(see glossary)* dated 1875 can be fixed to a wall of any age. A date stone may accurately record the building of the outer leaf of the wall in which it is set, but may ignore the fact that only the outer leaf of the wall was rebuilt.

A good example is the Saxon carved angel which is now located on the north chancel wall at Winterbourne Steepleton.

Figure 38 Winterbourne Steepleton, the Saxon Angel, currently installed on the north wall of the chancel, but previously located on the outside south wall of the tower. Its original location is unknown.

A casual visitor, or indeed a casual surveyor, might fairly assume that it had always been in this position, and thus the wall itself was Saxon. Both these assumptions would be errors. The angel was only moved to its present position within the last decade, according to explanatory material on display in the church, source unknown. Previously it had been built into the outside south west corner of the nave, and even this was probably not its original position. The erratic flight of this angel serves as a further warning about using *any* carved detail to date a wall or the plaster on it. As well as the example already noted at Hillfield, Pilsdon also has a medieval cresset stone built into its nave wall. Again, this does not *prove* that the walls (and their plaster) are medieval.

Date stones, cresset stones and flying angels have all contributed difficulties to task of identifying early plaster survival, but the most bizarre piece of misleading evidence was found at the east end of the north aisle at Puncknowle.

Figure 39 Puncknowle, monument and false window at the west end of the north aisle.

From the inside of the church there is an eighteenth century monument apparently set into a blocked window. Logic suggested that the window must be medieval to have been blocked by post-medieval monument builders. But this was deeply puzzling, as documentary sources suggested that the whole north aisle was a nineteenth century extension. *(Pevsner, N., 1972, p.352, and RCHM, 1952, p.189.)*
Outside inspection revealed that the whole window was a deliberately constructed Victorian dummy. Although externally glazed, it had been blocked as part of its original construction.

Puncknowle also provided an illustration of the need for caution when using small areas of coloured paint to suggest that a plaster surface is medieval. The theory is beguiling. Small areas of bright colour might be part of a post medieval text, but are more likely to be part of a medieval wall painting. However, deliberate painting is not the only source of bright colour. In this case, closer inspection showed that source of the colour was an accidental rust stain from a nearby Victorian fitting. Although every care has been taken to exclude the mis-identification of painted surfaces, there is a possibility that some of the early plaster identified by colour at the edges of overskim is really accidental staining.

It remains an open question as to how much this survey has been deceived by subtly misleading evidence.

A further difficulty is presented by damaged and repaired plaster on the east jamb of the priests door at Winfrith Newburgh. *(See photographs , chapter 15, on CD)* The repair has been placed in what is obviously a high stress area for plaster. The immediate environment is both damp and salt rich, and the jamb of the door liable to be accidentally kicked. The need for a repair appears to confirm that the area is subject to active ongoing decay, and is thus most unlikely to have surviving early plaster.

However, it was precisely this location that revealed the first definite evidence of early plaster below an overskim. At Warmwell, older plaster was revealed where a thin overskim has been brought up to, but not under a light fitting dating from the nineteen fifties. The exposed plaster appears to be late medieval, or possibly eighteenth century, from its composition *(See Chapter 5)*.

Figure 40 Warmwell, overskim plaster stopped at the edges of a relatively modern light fitting.

This is an interesting example of survival in a very exposed location. It indicates the specific danger of assuming that plaster will not have survived in areas likely to be damp or subject to impact. It also illustrates the general danger of assuming that plaster does not survive because a whole interior appears to have been thoroughly restored. The evidence of the survey suggests that it is most unwise to assume that conditions currently damaging modern plaster have necessarily damaged early plaster *(see chapters 4 and 14.6.4)*.

7.7.4 Dating from fragments

A recurring issue throughout the survey has been deciding *how much* old plaster was needed to constitute convincing evidence of wider survival. For example, at Hillfield, fragments of old colour were observed below a monument on the north wall. It is impossible to date the revealed paint from simple visual survey. All this survey can say is that there are grounds for reasoned suspicion that old plaster may survive.

At Knowlton, the south west corner of the nave has plaster survival, but this is of uncertain date.

Figure 41 Knowlton. Plaster survival on the south wall of the nave and on the tower arch.

Visual inspection suggests that it is roman cement *(see glossary)* based, and therefore likely to eighteenth century or later. It could be part of a post-ruin, but pre-Ministry of Works conservation programme. This is conjecture because the surviving fragments are small and do not definitely relate to any dateable features.

Yet another example is the plaster in the porch at Litton Cheyney.

Figure 42 Litton Cheyney. Layers of plaster separated by salt damage. Are they significantly different in date?

There is obviously one layer of plaster overskimmed over another, but is the lower layer any significantly older that the overskim? There is insufficient exposure of the lower layer to say, with any certainty, that it is not just an undercoat of the same age as the overskim.

To sum up, many of the discoveries of medieval plaster survival have been recorded as possible, rather than certain, because the areas of exposure involved are so small or there is no direct evidence on which to ascribe a date.

7.7.5 Do exposed areas of painted plaster define the complete extent of plaster survival ?

A central contention of this thesis is that commentators such as Pevsner *(Pevsner, N., 1972, passim.)* and the Royal Commission *(RCHM, 1952-1975, passim.)* have limited their recognition of painted plaster to those areas that are *obviously* exposed, without considering whether the *visible* exposure represents the *full* extent of survival. The danger inherent in this approach is illustrated by four of the surveyed churches :

Figure 43 : Cerne Abbas. The upper area of exposed medieval painted plaster appears too neat an regular to represent the full extent of the survival.

i Cerne Abbas is a large and complex church, with an unusual recent history, having had extensive structural modifications to the roof in the nineteen sixties. There is a substantial survival of medieval plaster in most parts of the church. This is likely to be much more extensive that the localised exposure of mural paintings suggests. These areas of exposure are altogether too orderly and neat, and are likely to have been deliberately limited to achieve this neatness. This is emphasised by comparison with the disorderly and random survival of painted plaster on the north nave wall at Winterbourne Steepleton.

ii Hillfield has a circa seventeenth century text that is partially exposed on the west end of the south nave wall. Its exposure seems to have been by random accident rather than by a deliberate campaign of conservation. There appears to be no reason why the present extent of exposure represents the full extent of survival.

iii Winterbourne Steepleton. The wall paintings were revealed accidentally in the nineteen eighties and conserved c.2000. *(information on display inside the church, source unknown)*

Figure 44 Winterbourne Steepleton. Neat but probably incomplete exposure of wall paintings.

It seems highly unlikely that the current exposure represents the full extent of the painting, since the texture of the underlying plaster does not change at the boundary of the paint exposure.

iv All the main secondary sources agree that Puncknowle has some of the most extensive wall painting survivals in Dorset. Pevsner is typical in that he specifically delimits the area of painting :

> *"PAINTING above the chancel arch, unrecognizable [sic], but dated c16(?) by the RCHM." (Pevsner, N., 1972, p.353).*

This survey revealed a rather more complex reality.

Figure 45 Puncknowle, junction of the north arcade wall with the chancel arch, showing the complex relationship of plaster fragments

Detailed examination of the junction of the north nave arcade wall and the north side of the chancel arch shows the difficulties in deciding the extent of plaster survival. *(See also photographs, chapter 15, on CD)* On the north nave arcade wall, immediately under the moulded plaster cornice, there appear to be fragments of plaster that match the painted plaster on the chancel arch. In other words, the area of medieval plaster may be much more extensive that the area of obvious wall painting.

To sum up, the evidence of this survey suggests there is no reason to assume that the present extent of wall painting exposure is a reliable indicator of the full extent of medieval plaster survival. The reason for the deliberate exposure of painted plaster is the *paint* and not the *plaster*. There also appears to be a strong tendency to display only those areas of medieval plaster that carry the finest painted decoration. There has never been a concerted movement to reveal and display historic plaster that is not painted, nor paintings that are not whole and beautiful.

7.7.6 Flooded detail

The south aisle window cills at Abbotsbury display a strange plaster detail *(See also photographs, chapter 15, on CD).*

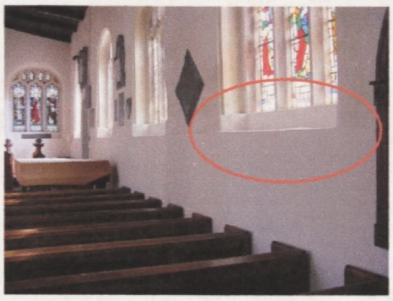


Figure 46 Abbotsbury. Carved stone details of the window cills flooded by later overskim plaster.

The lower areas of the carved jambs have been flooded with plaster, producing an awkward stop *(see glossary)* between the plaster surface and the carved stone. Similar stops can be observed where plaster abuts carved detail at Winterbourne Martin, Langton Herring, Long Bredy, Portesham and many other churches in the survey This flooding of detail is compelling evidence that the visible plaster surface is nineteenth century (or later) overskim. Medieval practice appears to always have been quite different with the plaster surface run-out or feathered into stone work details. Wherever thick and flat plaster is brought to an abrupt stop there is a strong suggestion that an early surface has been deliberately covered up. However visual survey cannot say what has been covered. There is clear scope for further research. *(See chapter 5) (See overskim, below), (Bucknall, J., 1987-93, pers.coms., Schofield, J., 1984-1993, pers.coms., Hadlington, M., 1987 to date, pers.coms.)*

7.7.7 Ground level survey.

Much of the wavy plaster observed by this survey was at high level. Abbotsbury, Long Bredy, Langton Herring, Cerne Abbas and Upwey are good examples. The accuracy and reliability of visual survey are obviously adversely affected when the surveyor is unable to get close to the survey area.

It is is very hard to assess how severely this issue impacted the the overall accuracy of the survey. It is unlikely that areas of modern plaster have been wrongly identified as wavy, but it it is much more likely that areas of wavy plaster at high level have simply been missed. Poor lighting, such as at Cranborne, will have substantially increased the risk of failing to see plaster . Short of artificially lighting every survey, it is hard to see how this issue could be definitively addressed.

7.7.8 Inexplicable evidence

One of the pleasant surprises generated by the survey was the *relatively* small number of completely inexplicable plaster details that were observed. However, there were some, including the following three churches :

i At Upwey *(See photographs, chapter 15, on CD)* there is a very marked contrast between the plaster immediately above the tower arch, and that on the upper parts of the same wall.

Figure 47 Upwey. Sudden change in the waviness of the plaster above the tower arch.

This is impossible to explain with any confidence. Both areas of plaster appear to be medieval. It could be due to a major structural change, such as the insertion of the present dressings of the arch. But it is equally possible that the upper edge of the smoother plaster is a medieval 'high tide mark'. The local plasterer was, perhaps, employed to carry out repairs and replastering, and this was how far his tallest ladder allowed him to reach.

Figure 48 West Knighton. Upper areas of the south wall of the nave showing greatly thickened areas of plaster.

ii West Knighton *(See photographs, chapter 15, on CD)* presents an equally inexplicable issue on the nave south wall towards its east end. The plaster here, above and beside the window head, appears to have been considerably thickened (by approximately 75 mm.), and is almost certainly an overskimming of earlier work. The mystery is why and how such thickness has been achieved. Is it solid plaster, or is it studwork supporting plaster on laths, as at Pilsdon. There is no certain explanation for this feature, but as at Pilsdon it may be related to outward lean of the wall.

iii The very damp plaster at Long Bredy *(See photographs, chapter 15, on CD)* displayed staining that appears to define buried structural features in the south nave wall.

Figure 49 Long Bredy. The very dark shape in the right foreground is part of a curtain.

However, even though the clarity of the staining is impressive, it does not give any clue to the nature or purpose of the buried feature. It is a keen reminder of the limitations of visual survey.

7.7.9 Interpretation of low level re-plastering

An assumption implicit throughout this thesis is that Victorian (or later) overskim is modern or recent and therefore is in good condition. Whilst this is generally true, exceptions were observed. For example, low level overskim plaster (up to 1.5 metres above floor level) at Loders, Litton Cheyney and Cerne Abbas had been extensively repaired Detail local repairs were also observed at Winfrith Newburgh. This survey produced no evidence to challenge the commonplace wisdom that low level plaster repair is usually a response to damp and salt crystallisation damage

What the survey fails to show is how much medieval plaster survives beneath these overskims and repairs to overskims. Evidence from Litton Cheyney and Winfrith Newburgh suggests that some does. In both cases, fragments of medieval plaster appear to have survived overskimming, damp and salt damage *and* repair to the overskimming.... *a treble survival.* This is an important point which strongly suggests how much caution is needed when directly associating plaster loss with difficult physical conditions.

7.7.10 Materials

The survey revealed a wide range of building materials used for the structure of Dorset church walls. Chalk, Churt, flint, Hamstone, Beerstone, greensand, and Carr stone, were all observed .

Since the survey was designed to record the survival of medieval plaster and not to make a record of the distribution of structural materials, only limited note was made of the materials found. With hindsight, this was significant omission, as the materials used for the structure of the church almost certainly play some role in the durability of internal plaster. Chapters 8 and 14.6 contain explorations and analysis of the relationship between structural materials and plaster survival, but this could have been much better developed had more data been available. *(See chapter 14.6.4.7.)*

7.7.11 Monuments, plaster survival behind *(See also chapter 14.6.5.2.)*

The author's conservation contracting experience, for example at Wroxeter and Longford in Shropshire between 1983 and 1993, suggests that medieval or post medieval monuments were often erected without significantly disturbing the wall plaster over which the monument was placed. Existing wall plaster was not disturbed except where fixings were placed into the wall. Once in position such monuments have effectively prevented Victorian restorers from gaining access to strip the hidden plaster.

Dorset is not richly endowed with monuments, when compared with many English counties. *(Easdaile, K. A., 1946, passim., Kemp, B., 1980, passim.)*, but examples of likely preservation of plaster by monument were found at Hillfield (on the south wall of the nave), Upwey (on the north wall of the north arcade), Cranborne (in the south aisle), Long Bredy (on the south wall of the chancel) and West Knighton (on the south wall of the nave)

The extent of plaster survival behind monuments has undoubtedly been diminished by large scale Victorian re-ordering of church interiors. This usually involved the the re-positioning of many of the monuments inside a church. Good examples were observed at Winterbourne Martin and Puddletown.

Figure 50 Winterbourne Martin.
Neatness and regularity in the layout of fittings, typical of through Victorian re-ordering.

Other interior features such as wainscoting or panelling sometimes protect plaster. Examples were observed at Warmwell and Winterbourne Steepleton *(See also photographs, chapter 15, on CD)*.

Figure 51 Warmwell. Medieval plaster protected behind wainscot.

An interesting variation on this theme was found at Fordington (Dorchester), where a fitted cupboard appears to have prevented nineteenth century plaster stripping.

Just as monuments and wainscoting can protect old plaster, so also have they prevented this survey from locating all of that plaster.

7.7.12 Multiple layers of post-medieval plaster

One of the most difficult issues facing this survey has been to discriminate between multiple layers of modern plaster, where damage has revealed fragments of the lower layers, and the exposure of old plaster under a single layer of overskim. Though great efforts have been made to correctly identify all exposures of buried plaster, these are often very fragmentary and small.

Figure 52 Litton Cheyney. How far do the overskimmed layers of plaster extend?

It is acknowledged that herein lies a potential source of error in the survey data. Examples of the problem include the apparent exposure of medieval plaster on the cill of the south chancel window at Litton Cheyney or the painted plaster adjacent to the monument on the south nave wall at Hillfield *(See photographs, chapter 15, on CD)* .

Even if non-destructive methods are employed to reveal hidden layers of plaster, it is going to be very difficult to discriminate between Victorian undercoats and overskimmed medieval plaster. This is discussed below in chapters 9 and 10.

7.7.13 Photographic interpretation problems

In general, the only problems inherent in the interpretation of photographic evidence have been excessive or inadequate lighting. However, there was one instance of a photograph recording a patchy colour changes in such a way that they appeared to be surface waviness.

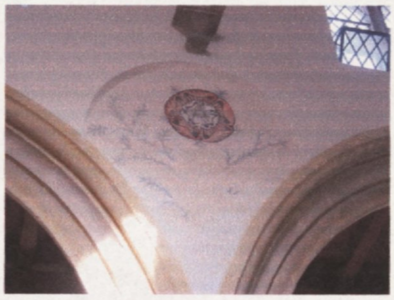
Figure 53 Puncknowle. Damp stains on flat plaster that were initially interpreted as waviness.

This occurred at Puncknowle on an area of plaster that had been recorded as modern, so that photographic evidence appeared to conflict with site observation. A further site visit revealed the true nature of the apparent waviness. The episode serves to warn that photographic evidence is open to misinterpretation and needs to be referenced to other means of recording. *(See also photographs, chapter 15, on CD)*.

7.7.14 Retouching, paintings

Since one of the most convincing proofs that plaster is medieval is for it to be carrying medieval wall paintings, the authenticity of medieval paintings is, in itself, an issue. The survey revealed two cases in which the authenticity was open to doubt. These are the roses painted on the south arcade spandrels at Upwey, and paintings on the north arcade spandrels at Cerne Abbas.

Figure 54
Cerne Abbas, left ,
and Upwey, right.
Both good examples of the dating problems posed by later retouching of early painting...are they genuine?



In both cases these paintings would seem to have genuinely medieval origins, but to have been heavily retouched and modified by Victorian or later restorers. This project has not been able to explore this issue in depth, and it is possible that areas thought to be carrying medieval paint are not genuine. *(See also photographs, chapter 15, on CD)*.

7.7.15 Ruins, special issues

Ruined structures, such as Knowlton Church, have presented special problems for the survey. Because the rate of decay of ruined structures is generally more rapid than that of equivalent roofed buildings, *(Schofield, J., 1884 onward, pers.coms., Bucknall, J., 1985* *onward, pers.coms., Hadlington, M., 1987 onward., pers.coms.)* the survival of a ruin *at all* is likely to imply frequent intervention by repairers. In other words the paradigm of medieval work surviving until the building was restored in the nineteenth century is less likely to apply, and the interpretation of apparently old plaster is made very difficult. With hindsight, it is questionable whether ruins should have been included in the survey.

7.7.16 Secondary sources, reliability

Hillfield demonstrates the dangers of accepting Pevsner at face value. It is dismissed in seven lines starting :

> *"Mostly by Withers, 1848... Old masonry and old features e.g. The c17 N and S windows... " (Pevsner, N., 1972, p.227-8)*

Far from being mostly by a nineteenth century architect, the evidence of this survey suggests that most of the nave interior is the result of a slow accretion of historical repair that is remarkably untouched by Withers or any other architect. There could hardly be a better example of the dangers of approaching a survey with preconception derived from documentary sources.

7.7.17 Snapshotting

All the processes impacting on the survival of medieval plaster are dynamic. *(Smith and Warke, 1996, Chapter 1.)* That is to say that they are not one-off events but continue over time. This presents a serious problem for the surveyor. If data is gathered by a single one-off site survey (a snapshot) it is impossible to assess how the snapshot fits into an ongoing pattern of decay. This, in turn, makes it very difficult to predict how quickly plaster is decaying or how likely its survival might be.

Winfrith Newburgh provides an excellent example of this. Medieval plaster survival observed during the first phase of the survey had been covered with modern plaster by the time of the second site visit. If only the second snapshot had been taken, the presence of old plaster would have been missed. It is an open question how far this issues has distorted the rest of the survey data.

7.7.18 Texts, post medieval

A significant number of surveyed churches contained visible post medieval texts. *(See glossary)* Examples were Cerne Abbas, Puddletown or Upwey.

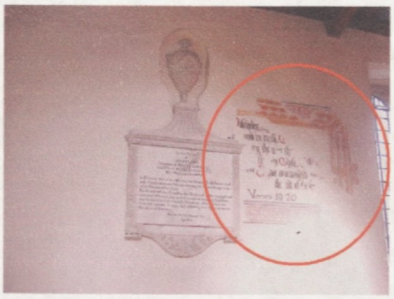


Figure 55 Upwey. Multiple layers of post medieval painted texts.

Most of these texts appear to be painted directly onto the limewash that was used during the Henrician Reformation to cover up wall paintings. This implies that the presence of post-medieval texts usually indicates that there is surviving medieval plaster beneath them. However, this survey does not directly support such a presumption. No conclusive evidence was observed of medieval plaster lying behind a post-medieval text.

7.7.19 Victorian wall painting

The survey revealed painting on the plaster above the chancel arch at Cranborne, . This is not mentioned by Pevsner, Morshead or the RCHM and appears from both the style of the painting and the flatness of the plaster to be Victorian. This demonstrates the danger of assuming that a painted surface is necessarily an old plaster surface.

7.7.20 Waviness

The survey revealed that wavy plaster was definable and observable and that large quantities exist in Dorset churches.

Figure 56
Whitcombe, wavy plaster.

The objectivity, accuracy and interpretation of this plaster survival is discussed in chapters 4.14, 5.8, 7.5. and in the other sections of this chapter. Individual examples of waviness are discussed in the photographic evidence section of chapter 15.

7.8 Conclusion : general success of the survey

There is no doubt that the survey has made a significant contribution to the understanding of medieval plaster survival in Dorset. Since this was the aim, the survey has been a success.

To summarise, this phase of the project has defined both the capabilities and limits of visual survey :

i It appears to be reliable to use the recognition of wavy surfaces to identify areas of medieval plaster.

ii It was not possible to accurately chronologically date areas of adjacent plaster, even where these have obviously different textures and surfaces iii It was often not possible to determine whether later overskim covered surviving early plaster. This can only be done by the development of the non-destructive survey techniques that are discussed in chapters 9 and 10.

iv Greater use of profiling would significantly improve the objectivity of the survey, though the extra time and effort involved would be considerable.

8. Analysis of the survey results

Note on the presentation of data in this chapter :

The full tables and maps on which this chapter is based are presented in chapter 12. (Both on paper and in chapter 15 on CD.)

To provide a more accessible structure this chapter contains, where relevant, composite tables constructed from the full data presented in chapter 12.

Dorset Church Plaster. Factors analysed for possible influence on plaster survival. All churches with definite plaster survival are listed.

Plaster survival key : y=definite survival, ps=possible survival, n=no survival, x=no data.
Geology key : numbers : 1=Lias, 2=Cornbrash, 3=Greensand, 4=Corallian, 5=Upper Oolite, 6=Chalk, 7=Sand/clay, 8=Clays.
Overskimming : churches are included if there is definite evidence that early plaster has been covered, or if the field survey thought it likely.
Source of data : tables and maps in chapter 12.

1. Church	2. Survey findings				3. Church details				4.Geological
Church name	Plaster survival			over skimmed	Architect	Date of dedication restoration	Parish population in 1851	Distance from railway	Material on which the church is built
	nave	chan	other						
Abbotsbury	y	y	y		x	x	1077	1	2
Affpuddle		x		y	TH Wyatt	1840, 1875	488	5	2
Askerswell		x		y	Bury	1858	224	2	3
Beaminster		x		y	White	1862, 1874, 1889	x	5	2
Bincombe		x		y	x	1882	231	1	6
Blandford St Mary		x		y	Pitt	1711, 1837, 1862	367	1	6
Broadwindsor		x		y	Allen	1868	1516	5	1
Burleston	n	y	ps		x	1910	71	5	6
Burton Bradstock		x		y	Prior	1897	1181	1	2
Cerne Abbas	y	ps	ps	y	TH Wyatt,Brandt, Potter, Hare	1870, 1960	1343	5+	6
Chickerell		x		y	x	1834, 1865, 1875	577	1	2
Chideock		x		y	Crickmay	1880, 1883	884	5	1
Church Knowle		x		y	x	1833	480	5	3
Compton Abbas, Old Church	n	n	y		x	x	0	5+	3
Cranborne	y	ps	y		Brandon	1874, 1875	2737	5	6
Dewlish	y	n	y		TH Wyatt	1872	442	5+	6
Dorchester, Fordington	x	x	y		Moule, Feacey	x	3147	1	6
Godmanstone		x		y	x	1848	179	5	6
Gussage, St Andrew	y	x	x		x	x	x	5+	6
Hillfield	y	n	x		Withers	1848	124	2	3
Iwerne Minster		x		y	TH Wyatt, Pearson	1870, 1880	703	2	3
Knowlton	y	y	y		x	x	x	5	6
Langton Herring	y	x	y		x	1827, 1858	246	5	6
Langton Matravers	n	n	y		Crickmay	1828, 1876	762	2	8
Leigh		x		y	Withers	1840, 1854	440	1	4
Lillington		x		y	Withers	1848	174	5	2
Litton Cheyney	x	x	y	y	x	x	507	5	3
Loders	y	x	x		x	1836, 1900	986	1	2
Mapperton		x		y	x	1846, 1908	85	5	2
Milton Abbas, Abbey	y	n	n	y	Wyatt, Middleton, Scott	1769, 1865	x	x	6
Oborne, Old Church	y	y	x		x	1533, 1800, 1950	0	5	5
Piddlehinton		x		y	Christian	1867	x	5+	6
Pilsdon	y	y	x	y	x	1830, 1875	95	5+	1
Puddletown	y	x	x		Ponting	1800, 1910	1297	5	6
Puncknowle	y	y	y		Houghton-Spencer	1660, 1678, 1891	467	5	2
Shapwick	x	x	y	y	Rogers	x	444	1	6
Stinsford	y	x	x		x	x	373	1	6
Stour Provost	x	y	n		x	1800	869	5	2
Studland	y	x	x		x	x	445	5	7
Tarrant Crawford	y	y	y	y	x	x	77	1	6
Upwey	y	n	y	y	x	1838, 1891, 1906	637	1	4
Wareham, St Mary	n	x	y	y	Donaldson	1840, 1841	1606	1	7
Wareham, St Martin	y	y	y	y	x	x	596	1	7
Warmwell	y	n	x	y	Bennett	1851, 1881	149	2	7
West Chelborough		x		y	x	1638, 1751, 1894	64	5	3
West Knighton	y	x	y		Hicks, Hardy	1893, 1894	270	1	6
West Stafford	y	x	x		Ponting	1640, 1898	229	1	6
Whitchurch Canonicorum		x		y	x	1822, 1847, 1887	1532	5	1
Whitcombe	y	y	y		x	1700, 1912	61	1	6
Wimborne		x		y	TH Wyatt, Pearson	1855, 1857,1891	4759	1	7
Winfrith Newburgh	y	y	y	y	x	1854	150	2	6
Winterbourne Martin	y	y	x		x	x	434	1	6
Winterbourne Stickland	y	y	y		x	x	407	5	6
Winterbourne Tomson	y	y	y		Powys	1931	37	2	6
Winterbourne Steepleton	y	x	x		x	1902	206	2	6
Wooton Fitzpaine	x	x	y		Birch	1600, 1872	361	2	1

Figure 57
Data on the possible reasons for plaster loss and survival, for those churches where survival is definite, or where there is a strong possibility of survival below later overskim.

Data is abstracted from maps and tables 12.2, 12.3, 12.4, 12.5, 12.7, 12.8,12.9, 12.10, 12.11, 12.12, 12.13, 12.16 and 12.19, which are presented in full in chapter 12.

8. Analysis of the survey results

8.1 Introduction

This chapter analyses the data produced by the survey to determine whether plaster survival can be predicted by the presence of any of a range of outside factors.

To avoid excessive length and complexity, this chapter reviews only those factors that were suggested by the survey data as possibly being capable of predicting the loss or survival of historic plaster. More general, supportive material, derived from literary sources, personal communications and the author's own experience is presented in chapter 14.6.

For ease of navigation, the factors affecting the loss and survival of plaster dealt with in chapter 14.6. are listed here :

8.2 Summary of loss and survival factors

The survey has demonstrated that there is a very wide range of reasons for the loss or survival of medieval plaster in Dorset churches. These can be grouped in a variety of ways. As an alternative to the categories used in this chapter, it would be valid to split the drivers of decay into those :

i related to human inspired activity *(See chapter 14.6.2, 14.6.3 and 14.6.4),*

or those

ii related to natural decay processes *(See chapter 14.6.4 and 14.6.5).*

The difficulty in achieving decisive categorisation reflects a significant underlying problem. Church interiors are complex and dynamic. They are ongoing physical, chemical and social experiments. All the factors leading to loss or survival of plaster inter-react with one another. This survey produced no example of a simple cause and effect relationship that could completely explain an individual instance of loss or survival. Despite this difficulty, or possibly because of the very challenge it presents, the rest of this chapter examines whether the survey data reveals factors that can be used to predict the survival or loss of plaster.

8.3 Analysis of the survey results : possible predictive factors

8.3.1 Introduction

The purpose of this section is to test the survey data against a range of criteria to analyse whether any factor, or combination of factors, can be used to predict the likelihood of plaster survival. Data from the survey was analysed using the following ten criteria :

i Extent and significance of scrape and overskim

ii By architect

iii By SPAB involvement

iv By correlation with documentary sources

v By date of restoration

vi By size of parish population

vii By geology

viii By accessibility

ix By construction materials

x By site conditions

These criteria were chosen as a result of discussions with architects specialising in the repair of historic churches and with the technical staff of the SPAB *(Schofield, J.,1985-2003, pers.coms., Bucknall, J., 1986-2003, pers.coms., Hadlington, M.,1985-2005, pers.coms., Ratcliffe, T., 1987-1993, pers.coms., Birdsall, N.,1987-2005, pers.coms.)* and as an intuitive response to the data produced by the survey. There is no doubt that the list of criteria is not exhaustive. There is considerable scope for further analysis using other criteria.

The survey data used in this analysis is presented in part where relevant, and presented in full in the tables and maps located in chapter 12.

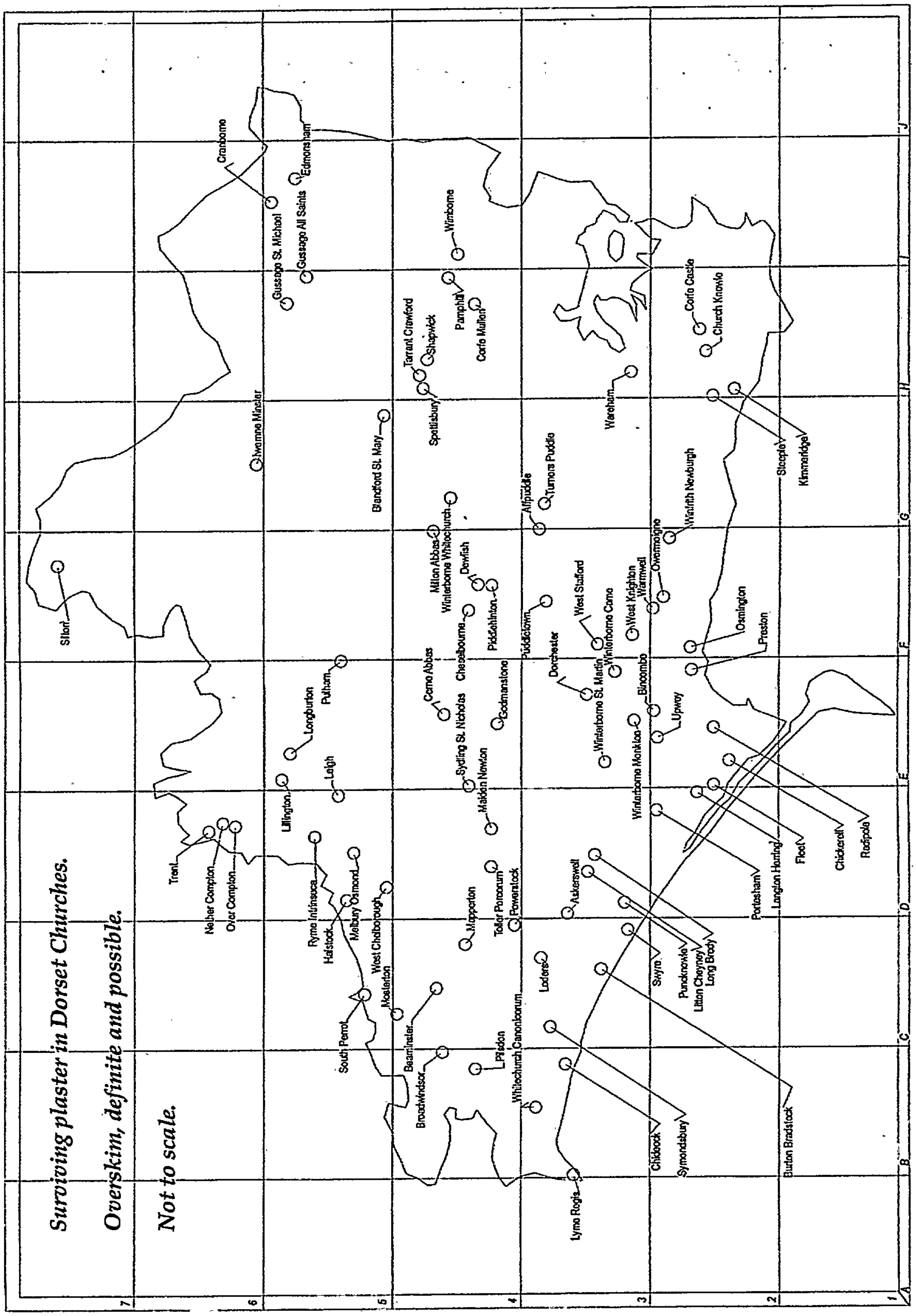


Figure 58
Definite and possible overskim in at least part of the church.

8.3.2 Interpretation of scrape and overskim

Scrape was the pejorative term used by the SPAB for the restorers' habit of removing medieval surfaces to clean them up. An old medical joke perfectly describes this cleaning process : the operation was a success and the patient died. In trying to present medieval surfaces properly, the entire surface was removed.

The results of the survey are hard to interpret. The majority of Dorset churches have had some surfaces scraped, but the technique has been inconsistently applied. The columns and capitals in a church may have been heavily scraped yet other areas retain early plaster. Loders is a good example of this *(See photographic evidence, chapter 15, on CD).* If it were assumed that the restorer starting to scrape an interior would carry on and finish the job, as for example, Wyatt did with the interior of Salisbury Cathedral, the evidence of the survey does not bear this out. Many Dorset churches have been partially scraped but also have surviving early plaster. The survey data on this point is necessarily incomplete, because later overskims have obscured the evidence. Thus the presence of scraped areas cannot be used to predict the likely loss or survival of other areas of early plaster.

Overskim is defined by this survey as the process of plastering over existing medieval plaster surfaces without first removing them. *(See chapters 7.7.2, 11.32, 11.8, 12.4, 12.5, 12.8, 12.19, 14.6.5.5.)* The great surprise of the survey has been just how frequently the Victorians did this, contrary to the widely held view that they were thorough in all their work. *(See map at the beginning of this section.)*

Assessing what lies under thick nineteenth century plaster is not directly possible using visual survey. The survey relied on detailed examination of the edges of apparent overskim to see if any fragments of medieval plaster were visible. Such fragments form the bulk of the direct evidence for survival of plaster in around sixty percent of the churches that are recorded as having surviving plaster, but their presence does not prove that there is extensive survival under the later plaster. It is similarly impossible to use the presence of thick post medieval plaster to make any inference regarding the likelihood of early plaster survival. The survey did not reveal any pattern in the data linking survival or non-survival simply to the presence of overskim. (*See chapter 12.)*

Dorset Church Plaster. Factors analysed for possible influence on plaster survival. All churches with definite or possible plaster survival are listed.

Plaster survival key : y=definite survival, ps=possible survival, n=no survival, x=no data.

Geology key : numbers : 1=Lias, 2=Cornbrash, 3=Greensand, 4=Corallian, 5=Upper Oolite, 6=Chalk, 7=Sand/clay, 8=Clays.

Overskimming : churches are included if there is definite evidence that early plaster has been covered, or if the field survey thought it likely.

Source of data : tables and maps in chapter 12.

1. Church	2. Survey findings				3. Church details				
Church name	survival								
	nave	chancel	other	overskim	Architect	Date of dedication or restoration	Parish population	Distance from railway (miles)	4.Geology
Broadwindsor		x		y	Allen	1868	1516	5	1
Warmwell	y	n	x	y	Bennett	1851, 1881	149	2	7
Wooton Fitzpaine	x	x	y		Birch	1600, 1872	361	2	1
Cranborne	y	ps	y		Brandon	1874, 1875	2737	5	6
Askerswell		x		y	Bury	1858	224	2	3
Piddlehinton		x		y	Christian	1867	x	5+	6
Chideock		x		y	Crickmay	1880, 1883	884	5	1
Langton Matravers	n	n	y		Crickmay	1828, 1876	762	2	8
Wareham, St Mary	n	x	y	y	Donaldson	1840, 1841	1606	1	7
West Knighton	y	x	y		Hicks, Hardy	1893, 1894	270	1	6
Puncknowle	y	y	y		Houghton-Spencer	1660, 1678, 1891	467	5	2
Dorchester, Fordington	x	x	y		Moule, Feacey	x	3147	1	6
Blandford St Mary		x		y	Pitt	1711, 1837, 1862	367	1	6
Puddletown	y	x	x		Ponting	1800, 1910	1297	5	6
West Stafford	y	x	x		Ponting	1640, 1898	229	1	6
Winterbourne Tomson	y	y	y		Powys	1931	37	2	6
Burton Bradstock		x		y	Prior	1897	1181	1	2
Shapwick	x	x	y	y	Rogers	x	444	1	6
Affpuddle		x		y	TH Wyatt	1840, 1875	488	5	2
Dewlish	y	n	y		TH Wyatt	1872	442	5+	6
Iwerne Minster		x		y	TH Wyatt, Pearson	1870, 1880	703	2	3
Wimborne		x		y	TH Wyatt, Pearson	1855, 1857,1891	4759	1	7
Cerne Abbas	y	ps	ps	y	TH Wyatt,Brandt, Potter, Hare	1870, 1960	1343	5+	6
Beaminster		x		y	White	1862, 1874, 1889	x	5	2
Hilfield	y	n	x		Withers	1848	124	2	3
Leigh		x		y	Withers	1840, 1854	440	1	4
Lillington		x		y	Withers	1848	174	5	2
Milton Abbas, Abbey	y	n	n	y	Wyatt, Middleton, Scott	1769, 1865	x	x	6
Abbotsbury	y	y	y		x	x	1077	1	2
Bincombe		x		y	x	1882	231	1	6
Burleston	n	y	ps		x	1910	71	5	6
Chickerell		x		y	x	1834, 1865, 1875	577	1	2
Church Knowle		x		y	x	1833	480	5	3
Compton Abbas, Old Church	n	n	y		x	x	0	5+	3
Godmanstone		x		y	x	1848	179	5	6
Gussage, St Andrew	y	x	x		x	x	x	5+	6
Knowlton	y	y	y		x	x	x	5	6
Langton Herring	y	x	y		x	1827, 1858	246	5	6
Litton Cheyney	x	x	y	y	x	x	507	5	3
Loders	y	x	x		x	1836, 1900	986	1	2
Mapperton		x		y	x	1846, 1908	85	5	2
Oborne, Old Church	y	y	x		x	1533, 1800, 1950	0	5	5
Pilsdon	y	y	x	y	x	1830, 1875	95	5+	1
Stinsford	y	x	x		x	x	373	1	6
Stour Provost	x	y	n		x	1800	869	5	2
Studland	y	x	x		x	x	445	5	7
Tarrant Crawford	y	y	y	y	x	x	77	1	6
Upwey	y	n	y	y	x	1838, 1891, 1906	637	1	4
Wareham, St Martin	y	y	y	y	x	x	596	1	7
West Chelborough		x		y	x	1638, 1751, 1894	64	5	3
Whitchurch Canonicorum		x		y	x	1822, 1847, 1887	1532	5	1
Whitcombe	y	y	y		x	1700, 1912	61	1	6
Winfrith Newburgh	y	y	y	y	x	1854	150	2	6
Winterbourne Martin	y	y	x		x	x	434	1	6
Winterbourne Stickland	y	y	y		x	x	407	5	6
Winterbourne Steepleton	y	x	x		x	1902	206	2	6

Figure 59
Data on the possible reasons for plaster loss and survival, for those churches where survival is definite, or where there is a strong possibility of survival below later overskim, sorted by known architect.

8.3.3 ***By architect*** *(See above and chapter 12.24.)*

The project has sought to explore whether individual nineteenth century architects were consistent in the way they applied the principles of restoration to the site detail of plaster stripping. The data on plaster survival was thus analysed by architect to see if any predictive pattern existed.

Data here was obtained from five sources :

i RCHM volumes for Dorset

ii Pevsner

iii Pitfield

iv Morshead

v Local information from parish guides and word of mouth

Where discrepancies exist between the five sources, Morshead is preferred as the project had access to his original notebooks and he appears to display the most extensive, detailed and best referenced research. Typical of the range of sources drawn on in his notebooks are the following :

Abbotsbury

"Faculty 29 (Sarum) Jan 1886, "...7. Repair and restore roofs and walls"

Cerne Abbas

"Hutchins 1870, IV.30. "In the year 1870 the parish church underwent considerable alterations at the sole expense of the incumbent. The galleries, which had long defaced all the western end, were entirely removed, and the fine arches and window under the tower brought into clear view...and above all, the ugly wall which had hitherto filled the whole space between the rood screen and the roof was pierced with the present arch, thus opening to view the broad east window."

Hillfield

"Quoting RCHM West Dorset, "p.123, It was in very bad repair when it was extensively restored by R. Withers, architect, of Sherborne."

(Normal referencing is impossible as the notebook pages are not numbered. Morshead, O., Notebooks.)

Morshead's notes often connect church restorations with named architects, but they are much less useful in describing the extent of works carried out.

Pitfield, though plainly indebted to Morshead is the only published source on architects' involvement that was significantly concerned with the extent of building works during restoration. It is to be greatly regretted that the planned volumes (E-Z) are unlikely ever to be published.

Pevsner appears to have access to wider sources on restoration work than does the RCHM, but does not properly reference these.

The first impression from the data is that seven named architects were responsible for a large proportion of the Victorian church restoration in Dorset. Sadly, however, the data contained set out in *tables 12.12., 12.13, 12.14, and 12.15* is not so clear cut. In reality, there is not enough data to make any firm connection between the architect involved and the likelihood of surviving plaster. The insurmountable problem with the data is the large number of churches with which no architect has be linked by this research. Detailed research into the archive of the Dorset County Chronicle might well solve this issue.

As noted in chapter 3.6, in the general literature review, The Dorset Record Office holds most of the drawings by the Dorchester architect Crickmay. There are undoubtedly many other surviving records. Other architects' practices may well have old drawings, and the RIBA *(see glossary)* is thought to have a substantial collection. Further research would probably succeed in linking particular architects to the currently anonymous churches, and might allow patterns to be discerned.

Again as noted in chapter 3.6, thorough research into the archives of the Dorset County Chronicle newspaper might also succeed in establishing a pattern of connection between individual architects and the likelihood of plaster survival.

8.3.4 By SPAB involvement

During the most active period of Victorian church restoration (c.1850-c.1900), the SPAB appears to have been the only group actively coordinating opposition to plaster removal. This does not mean that individuals, at local level, were not acting independently. However, this survey was not able to significantly research such individual efforts. There is likely to be material available in the Dorset County Chronicle archive *(DRO)* and the Dorset Natural History and Archaeology Society minutes and Proceedings *(DNHAS, Dorset County Museum)*. The survey did not examine either of the sources in detail.

Compared to some of the mighty philosophical battles that raged nationally about the restoration of churches, Dorset saw relatively little controversy. Works at Salisbury Cathedral, Lichfield Cathedral, Tewkesbury Abbey and Westminster Cathedral all generated national outcry and public venom. In Dorset the only truly vicious encounter between restorers and repairers seems to have been over the replacement of the West window in Sherborne Abbey. *(Venning P., c. 1995, pers.com ., Draper J., 1994-2000, pers.coms.)*

Limited research in the archive of the Dorset County Chronicle *(DRO)* suggests that its letters pages were never full of outraged comment on local church work. This not to say that there were no disagreements. SPAB has numerous files relating to Dorset churches going back to the earliest days of the Society, and whilst this project has not examined these in detail, sample research suggests that a file was only generated if there was an argument over restoration, as, for example, at Stratton north of Dorchester. *(File in SPAB archive, various dates from 1870-90.)*

One possibility for the relative peace on the philosophical front in Dorset is the role played by Thomas Hardy. As an architect, he is an enigmatic figure. He was an tireless supporter of SPAB, yet seems to have worked happily, over a long period, with the architectural firm of Crickmay and Sons. This practice was responsible for a significant proportion of all the ancient plaster destroyed by restoration in Dorset. *(Evidence produced by this survey, see chapter 12.23)* It is not easy to reconcile Hardy's campaigning with his choice of employer. There is plainly scope for more research here.

It is very difficult to objectively judge the effectiveness of SPAB at resisting the restoration of buildings. It has had many successes and many failures. It was highly influential in forming the early Ministry of Works conservation strategy for castles and abbeys, but it has been much less successful in influencing more recent work by English Heritage. *(SPAB Main Committee and Technical Panel Minutes, 1986-2000.)* It is arguable that its successes in restraining the restoration ambitions of senior churchmen have never been significant. (for example, the failure to prevent restoration of figures on the West Front at Wells Cathedral in the nineteen eighties, failure to exert any influence at Westminster Abbey during the most recent restoration, or failure to prevent restoration of the west porch at Chichester Cathedral in the nineteen nineties.) *(SPAB Main Committee Minutes 1986-2000.)*

In this complex, contradictory and incompletely researched context, it is hardly surprising that the survey produced little direct evidence that SPAB activity can predict likelihood of survival of plaster. As discussed in the conclusions *(See chapter 11.9.1)* this area could the subject of very productive further research.

8.3.5 By correlation with documentary sources (See table 12.25)

As with efforts to establish links between architects and restoration outcomes, the project has been unable to acquire sufficient data to make any predictive link between general information in documentary sources and the likelihood of plaster survival. For example, an attempt was made to explore the hypothesis that a change of bishop might affect the thoroughness of restoration, but significant data could not be found within the constraints of the project. The wealth, personality and religious interests of local landowners may well have influenced the thoroughness of restorations, and many clues to these factors are probably buried in the Dorset Record Office archives. The project did not have the resources to seek them out.

The survey did establish that documentary evidence from printed sources can be a very misleading predictor of plaster survival. For example, Pevsner's inaccurate dating of architectural details at *(See chapters 3.6.3.2, and 7.3.5.)* Hillfield and Pilsdon Churches *(Pevsner, N., 1972, p. 227-228 and p. 315)* severely hinders any attempts to see predictive patterns in the survey evidence.

As noted in chapter 7.7.5, printed sources tend to treat exposed areas of old plaster as representing the whole area of survival. The survey has found that such an approach is not supported by any evidence. This again highlights that printed sources cannot be seen as wholly reliable predictive tools.

Dorset Church Plaster. Factors analysed for possible influence on plaster survival. All churches with definite or possible plaster survival are listed.

Plaster survival key : y=definite survival, ps=possible survival, n=no survival, x=no data.

Geology key : numbers : 1=Lias, 2=Cornbrash, 3=Greensand, 4=Coralian, 5=Upper Oolite, 6=Chalk, 7=Sand/clay, 8=Clays.

Overskimming : churches are included if there is definite evidence that early plaster has been covered, or if the field survey thought it likely.

Source of data : tables and maps in chapter 12.

1. Church	2. Survey findings				3. Church details				4.Geology
Church name	survival			overskim	Architect	Date of dedication or restoration	Parish population	Distance from railway (miles)	
	nave	chancel	other						
Stour Provost	x	y	n		x	1800	869	5	2
Church Knowle		x		y	x	1833	480	5	3
Godmanstone		x		y	x	1848	179	5	6
Hilfield	y	n	x		Withers	1848	124	2	3
Lillington.		x		y	Withers	1848	174	5	2
Winfrith Newburgh	y	y	y	y	x	1854	150	2	6
Askerswell		x		y	Bury	1858	224	2	3
Piddletrenthide		x		y	Christian	1867	x	5+	6
Broadwindsor		x		y	Allen	1868	1516	5	1
Dewlish	y	n	y		TH Wyatt	1872	442	5+	6
Bincombe		x		y	x	1882	231	1	6
Burton Bradstock		x		y	Prior	1897	1181	1	2
Winterbourne Steepleton	y	x	x		x	1902	206	2	6
Burleston	n	y	ps		x	1910	71	5	6
Winterbourne Tomson	y	y	y		Powys	1931	37	2	6
Oborne, Old Church	y	y	x		x	1533, 1800, 1950	0	5	5
Wootton Fitzpaine	x	x	y		Birch	1600, 1872	361	2	1
West Chelborough		x		y	x	1638, 1751, 1894	64	5	3
West Stafford	y	x	x		Ponting	1640, 1898	229	1	6
Puncknowle	y	y	y		Houghton-Spencer	1660, 1678, 1891	467	5	2
Whitcombe	y	y	y		x	1700, 1912	61	1	6
Blandford St Mary		x		y	Pitt	1711, 1837, 1862	367	1	6
Milton Abbas, Abbey	y	n	n	y	Wyatt, Middleton, Scott	1769, 1865	x	x	6
Puddletown	y	x	x		Ponting	1800, 1910	1297	5	6
Whitchurch Canonicorum		x		y	x	1822, 1847, 1887	1532	5	1
Langton Herring	y	x	y		x	1827, 1858	246	5	6
Langton Matravers	n	n	y		Crickmay	1828, 1876	762	2	8
Pilsdon	y	y	x	y	x	1830, 1875	95	5+	1
Chickerell		x		y	x	1834, 1865, 1875	577	1	2
Loders	y	x	x		x	1836, 1900	986	1	2
Upwey	y	n	y	y	x	1838, 1891, 1906	637	1	4
Wareham, St Mary	n	x	y	y	Donaldson	1840, 1841	1606	1	7
Leigh		x		y	Withers	1840, 1854	440	1	4
Affpuddle		x		y	TH Wyatt	1840, 1875	488	5	2
Mapperton		x		y	x	1846, 1908	85	5	2
Warmwell	y	n	x	y	Bennett	1851, 1881	149	2	7
Wimborne		x		y	TH Wyatt, Pearson	1855, 1857, 1891	4759	1	7
Beaminster		x		y	White	1862, 1874, 1889	x	5	2
Iwerne Minster		x		y	TH Wyatt, Pearson	1870, 1880	703	2	3
Cerne Abbas	y	ps	ps	y	TH Wyatt, Brandt, Potter, Hare	1870, 1960	1343	5+	6
Cranborne	y	ps	y		Brandon	1874, 1875	2737	5	6
Chideock		x		y	Crickmay	1880, 1883	884	5	1
West Knighton	y	x	y		Hicks, Hardy	1893, 1894	270	1	6
Abbotsbury	y	y	y		x	x	1077	1	2
Compton Abbas, Old Church	n	n	y		x	x	0	5+	3
Dorchester, Fordington	x	x	y		Moule, Feacey	x	3147	1	6
Gussage, St Andrew	y	x	x		x	x	x	5+	6
Knowlton	y	y	y		x	x	x	5	6
Litton Cheyney	x	x	y	y	x	x	507	5	3
Shapwick	x	x	y	y	Rogers	x	444	1	6
Stinsford	y	x	x		x	x	373	1	6
Studland	y	x	x		x	x	445	5	7
Tarrant Crawford	y	y	y	y	x	x	77	1	6
Wareham, St Martin	y	y	y	y	x	x	596	1	7
Winterbourne Martin	y	y	x		x	x	434	1	6
Winterbourne Stickland	y	y	y		x	x	407	5	6

Figure 60

Data on the possible reasons for plaster loss and survival, for those churches where survival is definite, or where there is a strong possibility of survival below later overskim, by restoration date.

8.3.6 By restoration date (See above and tables 12.20, 12.21, 12.22, 12.23)

A major complication in assessing this data is that many churches appear to have multiple small restorations, rather than one large one. Where multiple restoration have taken place, the available sources *(that is, Pevsner, RCHM, Morshead and Pitfield.)* do not appear generally able to apportion work accurately between them. Perhaps the main reason for this is that all the documentary sources use the granting of faculties *(see glossary)* to date restoration work. Unfortunately, the granting of a diocesan faculty does not mean that the work was carried out promptly. Many years may elapse between grant and completion of work. Nor does it imply that the work actually done was a close match for that specified in the faculty. *(Dawson D., 1987-2000, pers.coms., Cox, J., 1989-2000, pers.coms., Brooks, C., 1987-1999, pers.coms, Draper, J., 1987-2000, pers.coms.)*

As the debate between restorers and repairers raged throughout the nineteenth century, fashions and attitudes did not remain constant. The survey data was analysed to see if the known date of restoration reflects these changes, and is causally connected to the thoroughness of the restoration. A complicating factor here is that economic conditions did not remain constant in rural Dorset throughout the nineteenth century, and it is very difficult to separate the effects of economics from the effects of architectural fashion.

Whether philosophy, fashion or economics were the main factors affecting the thoroughness of restoration, the survey data does not provide any straightforward connection between the date of restoration and the likelihood of plaster survival.

Dorset Church Plaster. Factors analysed for possible influence on plaster survival. All churches with definite or possible plaster survival are listed.

Plaster survival key : y=definite survival, ps=possible survival, n=no survival, x=no data.

Geology key : numbers : 1=Lias, 2=Cornbrash, 3=Greensand, 4=Coralian, 5=Upper Oolite, 6=Chalk, 7=Sand/clay, 8=Clays.

Overskimming : churches are included if there is definite evidence that early plaster has been covered, or if the field survey thought it likely.

Source of data : tables and maps in chapter 12.

1. Church	2. Survey findings				3. Church details				
Church name	survival			overskim	Architect	Date of delcation or restoration	Parish population	Distance from railway (miles)	4.Geology
	nave	chancel	other						
Compton Abbas, Old Church	n	n	y		x	x	0	5+	3
Oborne, Old Church	y	y	x		x	1533, 1800, 1950	0	5	5
Winterbourne Tomson	y	y	y		Powys	1931	37	2	6
Whitcombe	y	y	y		x	1700, 1912	61	1	6
West Chelborough	x			y	x	1638, 1751, 1894	64	5	3
Burleston	n	y	ps		x	1910	71	5	6
Tarrant Crawford	y	y	y	y	x	x	77	1	6
Mapperton	x			y	x	1846, 1908	85	5	2
Pilsdon	y	y	x	y	x	1830, 1875	95	5+	1
Hilfield	y	n	x		Withers	1848	124	2	3
Warmwell	y	n	x	y	Bennett	1851, 1881	149	2	7
Winfrith Newburgh	y	y	y	y	x	1854	150	2	6
Lillington	x			y	Withers	1848	174	5	2
Godmanstone	x			y	x	1848	179	5	6
Winterbourne Steepleton	y	x	x		x	1902	206	2	6
Askerswell	x			y	Bury	1858	224	2	3
West Stafford	y	x	x		Ponting	1640, 1898	229	1	6
Bincombe	x			y	x	1682	231	1	6
Langton Herring	y	x	y		x	1827, 1858	246	5	6
West Knighton	y	x	y		Hicks, Hardy	1893, 1894	270	1	6
Wooton Fitzpaine	x	x	y		Birch	1600, 1872	361	2	1
Blandford St Mary	x			y	Pitt	1711, 1837, 1862	367	1	6
Stinsford	y	x	x		x	x	373	1	6
Winterbourne Stickland	y	y	y		x	x	407	5	6
Winterbourne Martin	y	y	x		x	x	434	1	6
Leigh	x			y	Withers	1840, 1854	440	1	4
Dewlish	y	n	y		TH Wyatt	1872	442	5+	6
Shapwick	x	x	y	y	Rogers	x	444	1	6
Studland	y	x	x		x	x	445	5	7
Puncknowle	y	y	y		Houghton-Spencer	1660, 1678, 1891	457	5	2
Church Knowle	x			y	x	1833	480	5	3
Affpuddle	x			y	TH Wyatt	1840, 1875	488	5	2
Litton Cheyney	x	x	y	y	x	x	507	5	3
Chickerell	x			y	x	1834, 1865, 1875	577	1	2
Wareham, St Martin	y	y	y	y	x	x	596	1	7
Upwey	y	n	y	y	x	1838, 1891, 1906	637	1	4
Iwerne Minster	x			y	TH Wyatt, Pearson	1870, 1880	703	2	3
Langton Matravers	n	n	y		Crickmay	1828, 1876	762	2	8
Stour Provost	x	y	n		x	1800	869	5	2
Chideock	x			y	Crickmay	1880, 1883	884	5	1
Loders	y	x	x		x	1836, 1900	986	1	2
Abbotsbury	y	y	y		x	x	1077	1	2
Burton Bradstock	x			y	Prior	1897	1181	1	2
Puddletown	y	x	x		Ponting	1800, 1910	1297	5	6
Cerne Abbas	y	ps	ps	y	TH Wyatt,Brandt, Potter, Hare	1870, 1960	1343	5+	6
Broadwindsor	x			y	Allen	1668	1516	5	1
Whitchurch Canonicorum	x			y	x	1822, 1847, 1887	1532	5	1
Wareham, St Mary	n	x	y	y	Donaldson	1840, 1841	1606	1	7
Cranborne	y	ps	y		Brandon	1874, 1875	2737	5	6
Dorchester, Fordington	x	x	y		Moule, Feacey	x	3147	1	6
Wimborne	x			y	TH Wyatt, Pearson	1855, 1857,1891	4759	1	7
Beaminster	x			y	White	1862, 1874, 1889	x	5	2
Gussage, St Andrew	y	x	x		x	x	x	5+	6
Knowlton	y	y	y		x	x	x	5	6
Milton Abbas, Abbey	y	n	n	y	Wyatt, Middleton, Scott	1769, 1865	x	x	6
Piddlehinton	x			y	Christian	1867	x	5+	6

Figure 61
Data on the possible reasons for plaster loss and survival, for those churches where survival is definite, or where there is a strong possibility of survival below later overskim, by parish population.

8.3.7 By Parish population (See above and tables 12.15, 12.16 and 12.17)

The possibility that the size of the parish population played a part in the extent of restoration and plaster loss is examined by relating census data for 1851 to the plaster survival data.

It is an inviting and intuitive assumption that the size of parish population influenced the resources available for restoration and hence the thoroughness with which it was done. But, once again, reality appears to have been much more complex. At first glance *table 12.18* appears to show a strong skew towards the likelihood of small parishes not stripping their plaster. But this is not really the case. What the graphed result of table 12.18 actually shows is that most of the parishes in Dorset had small populations! There does not appear to be any causal connection between parish population and plaster survival.

Dorset Church Plaster. Factors analysed for possible influence on plaster survival. All churches with definite or possible plaster survival are listed.

Plaster survival key : y=definite survival; ps=possible survival, n=no survival, x=no data.

Geology key : numbers : 1=Lias, 2=Cornbrash, 3=Greensand, 4=Corallian, 5=Upper Oolite, 6=Chalk, 7=Sand/clay, 8=Clays.

Overskimming : churches are included if there is definite evidence that early plaster has been covered, or if the field survey thought it likely.

Source of data : tables and maps in chapter 12.

1. Church	2. Survey findings				3. Church details				4.Geology
Church name	survival			overskim	Architect	Date of dedication or restoration	Parish population	Distance from railway (miles)	
	nave	chancel	other						
Broadwindsor		x		y	Allen	1868	1516	5	1
Chideock		x		y	Crickmay	1880, 1883	884	5	1
Pilsdon	y	y	x	y	x	1830, 1875	95	5+	1
Whitchurch Canonicorum		x		y	x	1822, 1847, 1887	1532	5	1
Wooton Fitzpaine	x	x	y		Birch	1600, 1872	361	2	1
Abbotsbury	y	y	y		x	x	1077	1	2
Affpuddle		x		y	TH Wyatt	1840, 1875	488	5	2
Beaminster		x		y	White	1862, 1874, 1889	x	5	2
Burton Bradstock		x		y	Prior	1897	1181	1	2
Chickerell		x		y	x	1834, 1865, 1875	577	1	2
Lillington		x		y	Withers	1848	174	5	2
Loders	y	x	x		x	1836, 1900	986	1	2
Mapperton		x		y	x	1846, 1908	85	5	2
Puncknowle	y	y	y		Houghton-Spencer	1660, 1678, 1891	467	5	2
Stour Provost	x	y	n		x	1800	869	5	2
Askerswell		x		y	Bury	1858	224	2	3
Church Knowle		x		y	x	1833	480	5	3
Compton Abbas, Old Church	n	n	y		x	x	0	5+	3
Hilfield	y	n	x		Withers	1848	124	2	3
Iwerne Minster		x		y	TH Wyatt, Pearson	1870, 1880	703	2	3
Litton Cheyney	x	x	y	y	x	x	507	5	3
West Chelborough		x		y	x	1638, 1751, 1894	64	5	3
Leigh		x		y	Withers	1840, 1854	440	1	4
Upwey	y	n	y	y	x	1838, 1891, 1906	637	1	4
Osborne, Old Church	y	y	x		x	1533, 1800, 1950	0	5	5
Bincombe		x		y	x	1882	231	1	6
Blandford St Mary		x		y	Pitt	1711, 1837, 1862	367	1	6
Burleston	n	y	ps		x	1910	71	5	6
Cerne Abbas	y	ps	ps	y	TH Wyatt,Brandt, Potter, Hare	1870, 1960	1343	5+	6
Cranborne	y	ps	y		Brandon	1874, 1875	2737	5	6
Dewlish	y	n	y		TH Wyatt	1872	442	5+	6
Dorchester, Fordington	x	x	y		Moule, Feacey	x	3147	1	6
Godmanstone		x		y	x	1848	179	5	6
Gussage, St Andrew	y	x	x		x	x	x	5+	6
Knowlton	y	y	y		x	x	x	5	6
Langton Herring	y	x	y		x	1827, 1858	246	5	6
Milton Abbas, Abbey	y	n	n	y	Wyatt, Middleton, Scott	1769, 1865	x	x	6
Piddlehinton		x		y	Christian	1867	x	5+	6
Puddletown	y	x	x		Ponting	1800, 1910	1297	5	6
Shapwick	x	x	y	y	Rogers	x	444	1	6
Stinsford	y	x	x		x	x	373	1	6
Tarrant Crawford	y	y	y	y	x	x	77	1	6
West Knighton	y	x	y		Hicks, Hardy	1893, 1894	270	1	6
West Stafford	y	x	x		Ponting	1640, 1898	229	1	6
Whitcombe	y	y	y		x	1700, 1912	61	1	6
Winfrith Newburgh	y	y	y	y	x	1854	150	2	6
Winterbourne Martin	y	y	x		x	x	434	1	6
Winterbourne Stickland	y	y	y		x	x	407	5	6
Winterbourne Tomson	y	y	y		Powys	1931	37	2	6
Winterbourne Steepleton	y	x	x		x	1902	206	2	6
Studland	y	x	x		x	x	445	5	7
Wareham, St Mary	n	x	y	y	Donaldson	1840, 1841	1606	1	7
Wareham, St Martin	y	y	y	y	x	x	596	1	7
Warmwell	y	n	x	y	Bennett	1851, 1881	149	2	7
Wimborne		x		y	TH Wyatt, Pearson	1855, 1857,1891	4759	1	7
Langton Matravers	n	n	y		Crickmay	1828, 1876	762	2	8

Figure 62
Data on the possible reasons for plaster loss and survival, for those churches where survival is definite, or where there is a strong possibility of survival below later overskim, by geology.

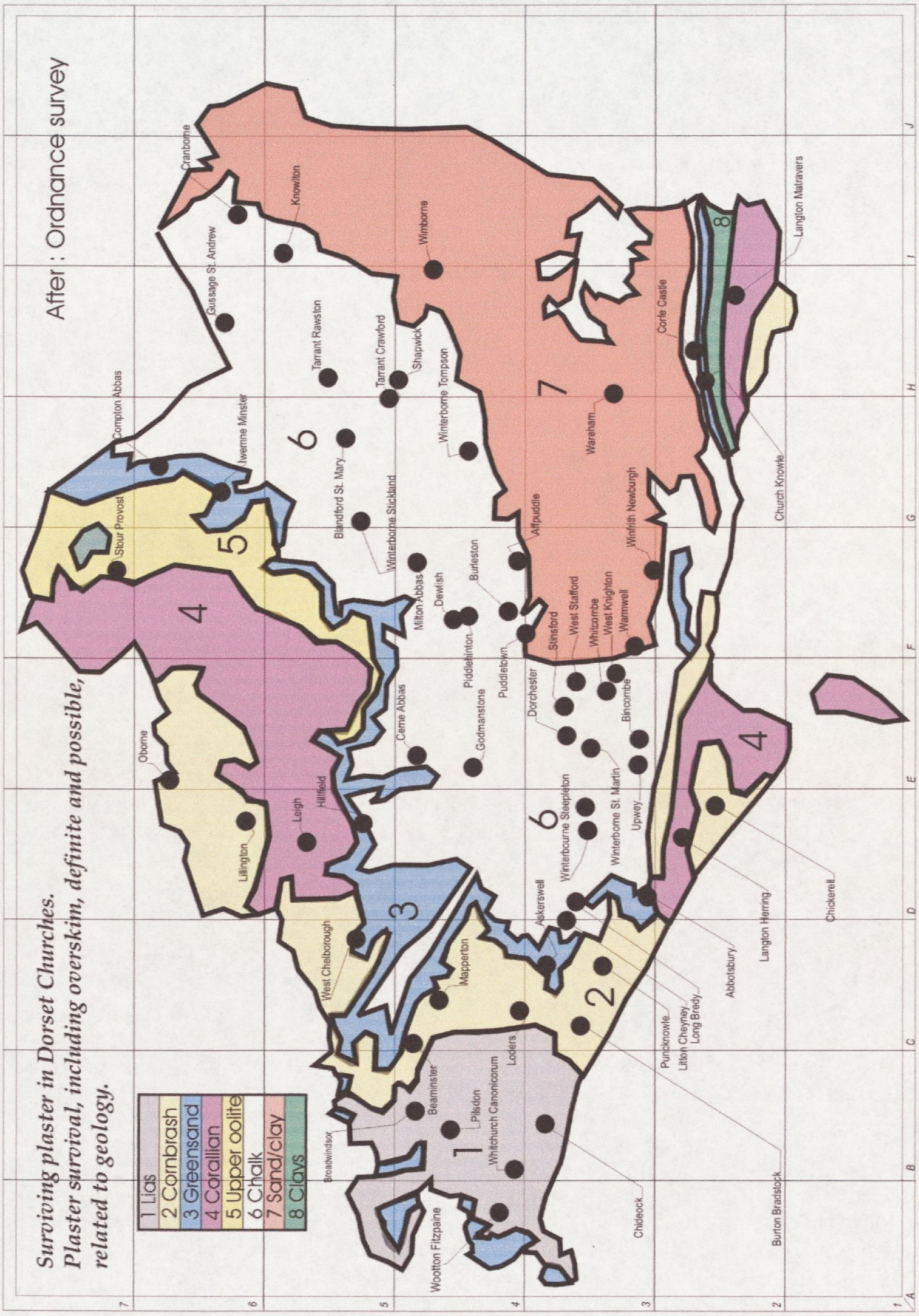


Figure 63
Data on the possible reasons for plaster loss and survival, for those churches where survival is definite, or where there is a strong possibility of survival below later overskim, by geology.

8.3.8 By geology (See maps. above and 12.6, and 12.7)

If there is a relationship between Dorset geology and plaster survival, it is a complex one. In theory, local geology must directly influence :

i Choice of building stone. Medieval builders did not often move stones over large distances except for very high status buildings. This survey, and the work of Jo Thomas *(Thomas, J., 1992-1994, passim.)* confirmed that most medieval work on Dorset churches is built from local stones.

ii Performance of building stones. Different geology imposes different quarrying and working techniques, which yield different sizes and shapes of stones. In turn, this alters the construction of walls, which alters the levels of water penetration and dampness , and thus the survival of plaster.

However, contrary to these reasonable expectations, the data from the survey did not support any direct connection between the stone used in church construction and the likelihood of plaster survival. Hence there is no obvious link between geology and plaster survival.

Indirectly, geology might influence plaster survival by dictating patterns of river drainage, land use, agriculture and ultimately parish prosperity, but if geology is a factor in the loss of plaster, it has been thoroughly overwritten and obscured by other influences.

8.3.9 By shelter and exposure : topography and planting

An acknowledged weakness of this survey is it has not adequately and consistently related the causes of interior plaster loss to external conditions. Attempts were made to link inside and outside conditions, but the issue of shade and weather protection was not adequately pursued during the field survey, and would benefit from much greater research.

For example, the yew trees at Pilsdon *(see photographic evidence on CD, chapter 15)* are undoubtedly influencing the moisture penetration of the walls by blocking some driving rain. They are also keeping the whole building cooler, thus affecting interior humidity and the movement of water and soluble salt within the structure. These factors must have some influence on the likelihood of plaster survival.

However, the survey did not gather sufficient data to reach any conclusion on whether plant or building shelter has had a significant impact on the survival of medieval plaster in Dorset churches. Indeed it is doubtful that any survey could gather much useful data in this area because of the problem of snapshotting. *(See chapter 7.8.)* The growth and decline of trees and other plants is a dynamic process that cannot be captured by one-off survey visits. The protection offered by plants at the time of the survey might well be wholly untypical of that existing for most of the life of the building.

The topography of the land surrounding Dorset churches was also assumed to be a substantial factor in providing shelter from the weather. However, once again, the data from the survey did not support any significant connection between topography and plaster survival. Long Bredy is a good example. It is enfolded by the the high chalk downs to the north and east, but it is in a valley open to the south west. Since the prevailing rain bearing winds are south westerly, the hills provide more of an illusion than a reality of shelter. In general, the steeper valleys and more sheltered villages lie in the south west of Dorset, between Dorchester and Bridport. If there were a correlation between sheltering topography and plaster survival, there should be a cluster of churches with plaster survival in this area. No such cluster exists.

Dorset Church Plaster. Factors analysed for possible influence on plaster survival. All churches with definite or possible plaster survival are listed.

Plaster survival key : y=definite survival, ps=possible survival, n=no survival, x=no data.

Geology key : numbers : 1=Lias, 2=Cornbrash, 3=Greensand, 4=Coralian, 5=Upper Oolite, 6=Chalk, 7=Sand/clay, 8=Clays.

Overskimming : churches are included if there is definite evidence that early plaster has been covered, or if the field survey thought it likely.

Source of data : tables and maps in chapter 12.

1. Church	2. Survey findings				3. Church details				
	survival								
Church name	nave	chancel	other	overskim	Architect	Date of dedication or restoration	Parish population	Distance from railway (miles)	4.Geology
Abbotsbury	y	y	y		x	x	1077	1	2
Bincombe		x		y	x	1882	231	1	6
Blandford St Mary		x		y	Pitt	1711, 1837, 1862	367	1	6
Burton Bradstock		x		y	Prior	1897	1181	1	2
Chickerell		x		y	x	1834, 1865, 1875	577	1	2
Dorchester, Fordington	x	x	y		Moule, Feacey	x	3147	1	6
Leigh		x		y	Withers	1840, 1854	440	1	4
Loders	y	x	x		x	1836, 1900	986	1	2
Shapwick	x	x	y	y	Rogers	x	444	1	6
Stinsford	y	x	x		x	x	373	1	6
Tarrant Crawford	y	y	y	y	x	x	77	1	6
Upwey	y	n	y	y	x	1838, 1891, 1906	637	1	4
Wareham, St Mary	n	x	y	y	Donaldson	1840, 1841	1606	1	7
Wareham, St Martin	y	y	y	y	x	x	596	1	7
West Knighton	y	x	y		Hicks, Hardy	1893, 1894	270	1	6
West Stafford	y	x	x		Ponting	1640, 1898	229	1	6
Whitcombe	y	y	y		x	1700, 1912	61	1	6
Wimborne		x		y	TH Wyatt, Pearson	1855, 1857,1891	4759	1	7
Winterbourne Martin	y	y	x		x	x	434	1	6
Askerswell		x		y	Bury	1858	224	2	3
Hilfield	y	n	x		Withers	1848	124	2	3
Iwerne Minster		x		y	TH Wyatt, Pearson	1870, 1880	703	2	3
Langton Matravers	n	n	y		Crickmay	1828, 1876	762	2	8
Warmwell	y	n	x	y	Bennett	1851, 1881	149	2	7
Winfrith Newburgh	y	y	y	y	x	1854	150	2	6
Winterbourne Tomson	y	y	y		Powys	1931	37	2	6
Winterbourne Steepleton	y	x	x		x	1902	206	2	6
Wooton Fitzpaine	x	x	y		Birch	1600, 1872	361	2	1
Affpuddle		x		y	TH Wyatt	1840, 1875	488	5	2
Beaminster		x		y	White	1862, 1874, 1889	x	5	2
Broadwindsor		x		y	Allen	1868	1516	5	1
Burleston	n	y	ps		x	1910	71	5	6
Chideock		x		y	Crickmay	1880, 1883	884	5	1
Church Knowle		x		y	x	1833	480	5	3
Cranborne	y	ps	y		Brandon	1874, 1875	2737	5	6
Godmanstone		x		y	x	1848	179	5	6
Knowlton	y	y	y		x	x	x	5	6
Langton Herring	y	x	y		x	1827, 1858	246	5	6
Lillington		x		y	Withers	1848	174	5	2
Litton Cheyney	x	x	y	y	x	x	507	5	3
Mapperton		x		y	x	1846, 1908	85	5	2
Oborne, Old Church	y	y	x		x	1533, 1800, 1950	0	5	5
Puddletown	y	x	x		Ponting	1800, 1910	1297	5	6
Puncknowle	y	y	y		Houghton-Spencer	1660, 1678, 1891	467	5	2
Stour Provost	x	y	n		x	1800	869	5	2
Studland	y	x	x		x	x	445	5	7
West Chelborough		x		y	x	1638, 1751, 1894	64	5	3
Whitchurch Canonicorum		x		y	x	1822, 1847, 1887	1532	5	1
Winterbourne Stickland	y	y	y		x	x	407	5	6
Cerne Abbas	y	ps	ps	y	TH Wyatt,Brandt, Potter, Hare	1870, 1960	1343	5+	6
Compton Abbas, Old Church	n	n	y		x	x	0	5+	3
Dewlish	y	n	y		TH Wyatt	1872	442	5+	6
Gussage, St Andrew	y	x	x		x	x	x	5+	6
Piddlehinton		x		y	Christian	1867	x	5+	6
Pilsdon	y	y	x	y	x	1830, 1875	95	5+	1
Milton Abbas, Abbey	y	n	n	y	Wyatt, Middleton, Scott	1769, 1865	x	x	6

Figure 64

Data on the possible reasons for plaster loss and survival, for those churches where survival is definite, or where there is a strong possibility of survival below later overskim, by distance from railway.

8.3.10 By accessibility (See above and maps 12.8, 12.9 and 12.10)

One of the working hypotheses adopted at the beginning of the project was that physical remoteness played a part in determining which churches were heavily restored and which were not.

In practice no evidence could be found of a link between location and restoration. Hillfield is certainly one of the hardest to reach of all the churches in Dorset, and the heavy clay soil of the area would have made Victorian lanes exceptionally uninviting in the winter, and it does have surviving plaster. But then again, so does Cranborne, Whitcombe and Puddletown, and they are some of the most accessible churches in Dorset.

Major restorations are very material use intensive. They require large quantities of stone, sand and lime, all of which are difficult and expensive to transport. The coming of the railways vastly reduced the cost of transporting these building materials. This alone may have brought the costs of restoration within the grasp of poorer parishes. Improved transport also changed the role of architects. Towards the end of the nineteenth century it would have been possible for a Dorchester based architect to spent a working day on site, at almost any Dorset church, without having to stay away from home for the night. This must have significantly have increased the level of supervision exercised by architects. Maps 12.8, 12.9 and 12.10 define the distance to the nearest railway in all parts of Dorset, and illustrate whether access to railway transport affected the likelihood of plaster survival. Although the local difficulties of service frequency and getting from station to site are not explored, it is plain that no church in Dorset was remote enough to guarantee it against being heavily restored.

In short, a link between church remoteness and plaster survival is a tempting theory that is not supported by the survey data.

8.3.11 By construction materials

The survey data was analysed to see if there was any link between use of particular construction materials and the survival of old plaster. As noted in chapter *(14.6.3.8)* there is no strong link between building stones and plaster survival.

Other materials considered were :

i Roof coverings. The roof coverings of most Dorset churches were changed in the nineteenth century to either clay tile or Welsh slate. They were either thatch or stone slate before this. Both early methods are fraught with disadvantage. Thatch rots and leaks. Stone slates (at least the types available in Dorset) tend to be roughly shaped and allow driving rain and snow to penetrate. However, it is impossible to make any link between historic roof coverings and plaster survival because the survey produced no data on the type or standard of maintenance for any pre-nineteenth century roof coverings. As noted above *(14.6.4.13)*, the Victorian adoption of new roof coverings was usually associated with the installation of gutters and downpipes. These innovations have had a profound impact on the dampness of churches and thus on the survival of old and new plaster alike.

ii Mortars. *(See Chapter 4.)* It is likely that the nineteenth century adoption of patent cements and Ordinary Portland Cement have made the interiors of Dorset churches significantly damper than they were. However, the survey gathered no data directly linking mortar changes to the loss of internal plaster.

iii Metals. Lead roofs and the lead cames around window glass were the only uses of metal in Dorset churches that are directly relevant to dampness and plaster survival. The detailing of both continued unchanged from the medieval period until the middle of the twentieth century. This was born out but by unrecorded but extensive observation during the survey. Thus there does not appear to be any direct link between metal use and plaster survival.

8.3.12 By site conditions

Consideration of geology and its related implications gives only a very generalised picture of the site in which a church is located. A whole range of entirely unpredictable local features exist at every Dorset church. For example, the physical constraints of the site interact with the size and mortality of the parish population to affect the density and number of burials in the churchyard. This in turn governs the severity of ground level rise and the concentration of soluble mineral salts that are likely to damage internal plaster. As another example, exterior shelter from trees or neighbouring buildings will have unpredictable benefits for interior plaster. Yet again, consider the case of Fleet Old Church, that was, one dark and stormy night in the early nineteenth century, wrecked through inundation by the sea. *(RCHM., 1952, p.109)*

The informal and unrecorded observation done by the survey has produced a strong impression that the cocktail of local local site conditions is a significant factors in survival of old plaster. However, it is only an impression. That cocktail is so complex that the survey generated only a generalised impression of its workings that cannot be used to formulate any specific connections. *(See chapters 14.6.4 and 14.6.5.)*

8.3.13 By oddity

A premise used throughout this survey has been that unusual details imply that a standard Victorian restoration approach has not been fully implemented. In other words, Victorian restoration and re-ordering had a general tendency to standardise church interiors, and where an interior has not been standardised there must be a enhanced possibility that restoration has not been thorough. Thus, in general, idiosyncrasy could well imply plaster survival. The interior at Pilsdon *(See photographic evidence on CD, chapter 15.)* suggests that this premise may have some validity, but it would be unwise to overstress it. The survey did not produce conclusive evidence, at least in part because this criterion is highly subjective. Certainly the reverse is not true : no idiosyncrasy does not equal no plaster survival.

8.4 Conclusions

8.4.1 Introduction

This chapter has sought to analyse the survey data using a varied selection of criteria, to determine if it is possible to predict the likelihood of plaster survival.

8.4.2 Limitations of this analysis

Due to time and resource constraints, at least ten further factors that might influence plaster survival that have not been definitively addressed. The survey data could be analysed in at least fourteen further ways :

i By land use. Does the pattern of local agriculture mean that some parishes had more real disposable income to spare for restoration than others? Is that income divided differently depending on the type of agricultural activity? The answer to both these speculations would appear to yes. There seems little doubt that the sheep farming of the Dorset chalk uplands produced a handsome return for medieval farmers, but that return was concentrated in the hands of a few wealthy men. *(Hill, C., 1976, passim., Hoskins, W.G.,1973, passim.)*

ii By proximity to sea /salt. Just as topography and shelter form plants must have had a role in the historical church dampness (and hence plaster survival), so must proximity to the sea have had an influence. In particular, churches close to the sea probably would have been built using sea sand. The salt contained in this sand would have had a long-term damaging effect on any plaster *(See chapter 14.6.4.19)*

However, it is hard to see how such a link could be proved without taking extensive samples.

iii By financial accounts. Examination of the Diocesan records, *(Salisbury Diocesan Records Office)* together with reports in the Dorset County Chronicle, *(DRO)* would probably yield considerable information on the work actually done during restoration of Dorset churches. Work done by Joan Brocklebank *(Brocklebank, J., 1979, passim.)* suggests that there is a wealth of relevant detail in such sources. The Dorset Record Office also holds very large quantities of of primary source material detailing wills and bequests. Researching this material would provide much incidental information on the funding of church restorations, that might in turn, provide a means of assessing how thorough those restorations were. However, working from wills and accounts is notoriously time consuming. Information recorded for specific legal reasons has to be unpicked by the reader to gain any insight into how it might affect local church plaster.

iv By the attitudes and power of the local landowner. The control of the local church has always, in theory, rested partly with the local churchwardens and partly with the local priest. *(Bettey, J.H., 1987, passim)* Reality, as ever, was more complex. A major player in any matters affecting the restoration of the local church would have been the local squire. Limited research into the Dorset County Chronicle and Dorset Natural History and Archaeology Society Archives suggests that substantial information is available that would allow some assessment to be made of how local landowners used influence and patronage to directly influence the outcomes of church restorations. As with research into financial accounts, researching at this level is task more measured in lifetimes than in doctorates.

v By local interest or pressure group involvement. As with the role of the local squire, it is very likely that significant amounts of archive material, particularly from the Dorset County Chronicle, exist that could shed light on how local community activists organised controlled and even resisted church restoration. Once again, the research effort required to collate the data would be prodigious.

vi By personality, wealth and religious outlook of the priest. Personal religious factors are likely to have a very important effect on the level of church restoration. It is unlikely that such personal data will ever have been directly recorded.

vii By size and complexity of building. Large and complex structures, with complex roofs, might be less likely to remain weather tight and thus might be less likely to retain early plaster. Size and complexity of churches must usually depend on the wealth of the parish or local land owner. The survey produced no data to suggest whether the wealth applied to the original creation of the building was also applied to its maintenance.

viii By survival of other features. It is possible that the extensive survival of other architectural features, apart from plaster, might imply that the whole building had escaped the most destructive and thorough Victorian restoration. Whitchurch Canonicorum, with its surviving early medieval shrine is a good example. However, the survey did not collect the data necessary to explore this possibility.

ix By type of roof covering. Medieval Dorset churches appear to have used every available type of roofing material. Evidence for thatch, stone tiles and metal was all observed during the survey. It is likely that the different durability and effectiveness of different roof coverings will have lead to greater or lesser leakage damage to internal plaster. Once again, however, research into this issue was outside the scope of the survey.

x By individual donations. It has been noted above that the design and maintenance of a church depends on the wealth of the priest, the parish and the landowner. However, the wealth of a church, and hence its ability to afford thorough restoration, also depends on the wealth and generosity of individual benefactors. The widow's mite may be small, but the cumulative effect of many small donations can be very significant. It is not easy to see how any research could trace and quantify the extent to which individual donations made church restoration possible.

xi Does geographic location, apart accessibility, of a church influence the likelihood of plaster survival? For example are the churches that are nearer to major centres of population more likely to have lost their plaster? The survey produced no discernible relationship between geographic location and likelihood of plaster survival.

xii Does the general dampness of the site influence the likelihood of plaster survival? The survey has produced no data on this possibility. Indeed, such evidence as was found would appear to contradict the obvious assumption that churches in damp locations would tend to lose their plaster irrespective of any restorations. In particular, two churches with surviving plaster, Winterbourne Tompson and Tarrant Crawford are both located in very wet sites that are heavily polluted with animal urine and excrement.

xiii Does the cheap transport of building stone influence the likelihood of plaster survival, where a navigable river made such cheap transport possible? Although the Dorset Stour was probably navigable to well above Blandford, making many of the churches of central Dorset reachable by river, this is an area where the survey has provided no data. It is interesting that the work of Jo Thomas does not suggest that river transport of stone played a significant part in church building practice. *(Thomas, J., 1992-1994, passim.)* , but this survey was not designed to record the stone used in each church. Despite the lack of survey evidence, there must remain a very strong presumption that the size and type of stones used in the construction of the church must have a direct influence on the life-span of interior plaster. At the simplest level, smaller rougher, more porous and permeable stones will tend to transport more driving rain and/or rising damp into the building.

xiv Does landscape use influence the likelihood of plaster survival ? The final issue of significance not to be addressed by the survey, again carries a complex answer. Until very recently, almost all Dorset parishes were completely dependent on agricultural incomes . Even now, most still are. Patterns of prosperity in agriculture are bound to economically impact on the physical condition of the local church. No money meant no maintenance and possibly no restoration. Paradoxically, agricultural depression was a major feature of the middle and late nineteenth century. The very period at which restoration and plaster stripping was at its most intense, coincided with some of the hardest economic times that Dorset has ever known. The data produced by the survey throws no light on this paradox.

8.4.3 Discussion

The survey produced a large amount of complex data on the possible survival of medieval church plaster. The quantity and nature of the data has made predictive analysis very difficult. If a much smaller sample of churches had been chosen it might have been possible to examine the factors affecting each individual church in much more detail. However, without this general survey, it would be impossible to know if any examples of Dorset church plaster existed that could be researched in greater depth.

8.4.4 Scope for further research

The analysis in this chapter highlights that this thesis forms a starting point for further research, that will allow the thorough analysis of the of the survey data against the criteria discussed above.

9. Objective survey methods.

9.1 Introduction.

The visual survey of Dorset church plaster, reported in detail in chapter 07, has produced a substantial data base. *(See chapter 12.)* Every effort has been made to make this data as reliable and objective as possible. However, the visual recognition of wavy plaster always has an element of subjectivity. No two surveyors will see waviness in quite the same way. Changes in lighting conditions will make a single surveyor produce inconsistent results. Above all, visual survey rarely offers any clue as to whether thick nineteenth century plasters overskim earlier plaster. This goes to the heart of the issue addressed by the project. Careful visual survey can recognise the extent of pre-nineteenth century plaster survival, but it can only guess at what might be hidden. The evidence of the visual survey strongly suggests that significant areas of medieval plaster are buried beneath nineteenth century overskim, but cannot provide objective proof of this.

This chapter takes the extensive but subjective data from the visual survey of Dorset church plaster and reviews the methods available for giving the data a more objective basis. In particular, it explores the possibilities for adapting ultrasound equipment to find and map hidden layers of old plaster.

This chapter does not pretend to be, and should not be read as, an in depth review of the science implicit in the survey techniques discussed herein . The relevant aim of this project was :

> *"To establish a reliable, objective and practical method of survey for locating medieval church plaster" (See chapter 3.)*

And the relevant objective was :

> *"To explore and analyse the weaknesses inherent in a visual approach to survey of plaster survival and to explore practical and affordable techniques for improving the objectivity and utility of the survey process" (See chapter 3.)*

The contribution made by this chapter is to specifically fulfil the aim and objective stated above.

It should be further noted that this aim and the objective both refer specifically to the requirement that any survey technique should be *practical* and *affordable*.

To place these requirements in context, the following six issues need to be considered :

i A piece of survey equipment costing £50,000 (for example, a complete Ultran pitch catch ultrasound scanner) *(Kirby, C., 2005, pers.com.)* would be more expensive than the combined annual maintenance budget for all the rural churches in Somerset and Dorset. *(Dawson, D., 2003, pers.com., Watts, W., 1994-2005, pers.com.)*

ii There is no money whatever in most rural Dorset church budgets for speculative survey work *(Watts, W, 1994-2005, pers.com.)*

iii Because of time and cost constraints, almost all church surveys are undertaken by surveyors working alone. This means that any technical equipment must both portable and within the technical abilities of a generalist surveyor. *(Birdsall, N., 1997-2005, pers.coms.)*

iv Few rural churches in Dorset have close vehicle access, most have steps, narrow doorways or other obstacles to the transport of heavy equipment

v Most rural churches in Dorset do not have any form of effective climate control and are therefore often very hot (or cold) and damp.

vi Many rural Dorset churches do not have an electricity supply, and of those that do, many installations are not capable of safely handling significant loads.

In short, this chapter is intended to discuss only those survey techniques that are relevant to the churches in the survey.

9.2 Destructive survey

The traditional (that is, widely adopted in recent times) method of investigating for the presence of wall paintings, and thus by analogy for ancient plaster, is to take scrapes to reveal hidden surfaces. These scrapes are also referred to as windows. *(See Chapter 14.6.3.12.)*

This practice is akin to traditional archaeology and destroys one set of evidence in order to reach the layers beneath. *(See chapter 14.6.3.6.)* Practitioners appear to believe that the acquisition of knowledge excuses the destruction of the object under investigation. *(Rahtz, P., c.1990, pers.com., Darville, T., c.1998, pers.com.)* Now that non-destructive alternatives to excavation are developing, it is not easy to grasp the ethical basis of continuing with such an approach.

9.3 Non-destructive survey : x-ray

X-rays are very high frequency (short wavelength, below 10^{-9} metres) electromagnetic waves. *(Dorrell, P., 1989, p.199)*

They can penetrate most non-metallic materials to varying degrees. They are used by transmitting them through the structure being examined and exposing a photographic plate to them on the far side of the structure. The technique requires high levels of energy input and expensive photographic resources. The equipment is bulky and delicate. Mass public medical exposure to high energy X-rays has proved that they are very dangerous, with a particular risk of causing cancer and mutagenic effects in anyone contacted by them. There would appear to be no safe dose level. *(Radiologists at South Dorset NHS Trust, 2001, pers.com.)*

The primary application of x-rays has always been medical, though they are also widely used in industry for weld testing and crack detection.

In the art world, X-rays have been used extensively and successfully to image multiple layers on easel paintings, and are said to have yielded useful information on the hidden layers of multiple layer wall paintings. Leonardo's Last Supper, for example *(Bertelli, C., 1983, p.664 - 686)* This can be done because the different pigments used in the paint layers have different x-ray absorption characteristics *(See below, Figure 65)*. It is very likely that old plaster, overskimmed by the Victorians, could be located if it still retained surface decoration. However, the technique would be of no use in discriminating between layers of plaster if no paint was present, because the x-rays would all be afforded equal paths through successive layers of homogenous materials as indicated in *Figure 66*.

Even where x-ray detection could theoretically work, its cost, complication and danger make it an impractical field tool. This is born out by the very restricted use so far made of the technique outside of conservation laboratories.

Figure 65. X-rays 01 : painted plaster

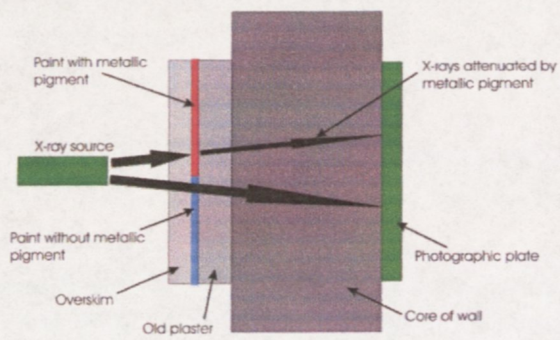
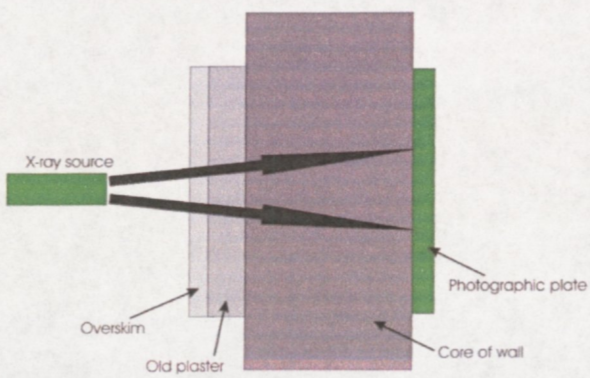


Figure 66 X-rays 02 : non-painted plaster



The X-ray techniques discussed here should not be confused with X-ray diffraction (XRD). This is a microscopy technique used for the molecular analysis of materials in the laboratory. It does not have any apparent field application for the detection of ancient plaster.

9.4 Non-destructive survey : Ground penetrating radar

Ground penetrating radar has been used extensively and with some success in field archaeology and in crime scene investigations. By no means all commentators agree on its merits and some are somewhat sceptical, as Blake suggests *(Blake V.S., 1994, p.175)* : Radar is again an electromagnetic wave, but is emitted at lower frequencies / longer wave lengths than x-rays (10 MHz to 1,000 MHz or 300,000 down to 700 x 10^{-9} metres). *(Dorrell, P., 1989, p.199).*

Unlike x-rays, the physical behaviour of radar waves allows them to be reflected from a wide variety of objects, surfaces and structures. Such surfaces include most of the materials used to construct buildings. Indeed it is only the recent exotic family of materials developed for military purposes, such as Kevlar, that do not reflect radar.

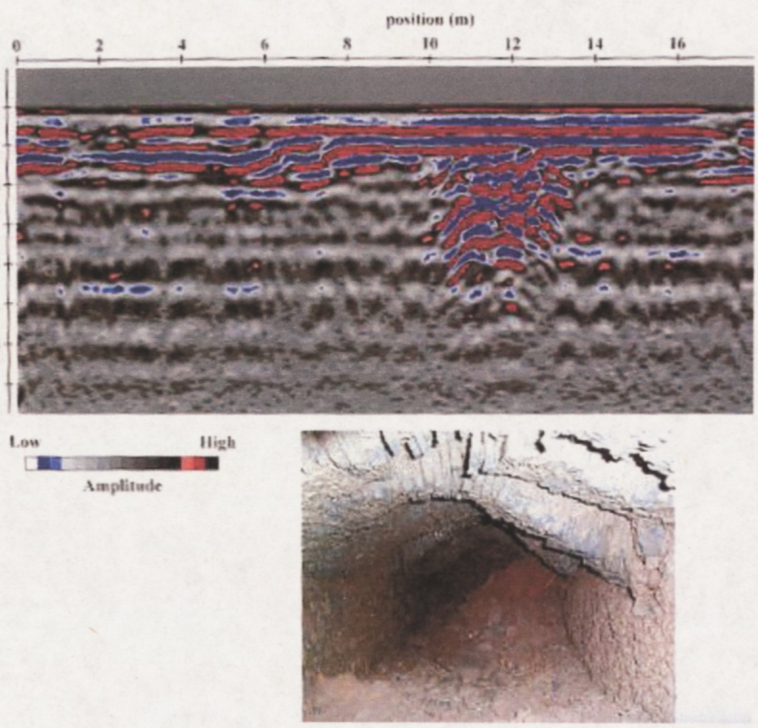
Radar appears to be very much safer than x-rays, and its widespread use in everyday life to facilitate policing and navigation, does not suggest that any health risks are currently being taken seriously. However, significant discussion of the safety implications of *any* electromagnetic radiation is not within the scope of this thesis.

One particular application of radar could conceivably be adapted to detecting overskimmed layers of plaster. So called ground penetrating radar has been proved to be capable of discriminating between different densities and structures in soil and masonry. However its utility to this project is far from certain. Depending on the frequency and power output, the equipment is large, delicate, expensive and very heavy,

> *" the lower frequency antennae are so large that they often have to be towed by a motorised vehicle." (Gaffney and Gater, 2003, p.49).*

Pulses of radar energy are transmitted and received by a pair of transducers and the time delay between the emission of the pulse and its return can be used to calculate the distance between the transmitter and the reflecting object or structure. This calculation can be displayed graphically.

Figure 67



Ground penetrating radar :
"Tyler Hill tile kiln. GPR radargram across the kiln. Photograph of the interior of the intact kiln" (Gaffney and Gater, 2003, plate 21, following p.96).

The upper part of this image is a screen capture of the display produced by ground penetrating radar deployed over the hollow structure shown in the lower picture.

These images illustrate how hard it would be to apply GPR to plaster layer detection. Even massive structures produce images that are very hard to interpret.

The frequency used significantly affects how the radar waves penetrate and are reflected.

> *"The penetration of the GPR system is largely dependent on the frequency that the transmitter emits the pulse of energy....The electrical properties of the soil are the dominant factors that have to be taken into account when trying to assess the likelihood of a 'success' at a site. Essentially the energy will be dissipated in*

material of high conductivity, so much so that even thin lenses of clay may render a survey unfeasible…high salinity, such as seawater will also cause loss of signal" (Gaffney and Gater, 2003, p.48)

Since church walls are likely to contain clay mortar and also large concentrations of soluble mineral salts, there are obvious theoretical problems in applying ground penetrating radar to church plaster.

Frequency/wavelength also have a significant role in determining the level of detail that can be resolved *(Gaffney and Gater, 2003, p.49)*. Generally this is fairly poor. For example, ground penetrating radar will disclose the dimensions of a grave, but not resolve the fine detail of a skeleton within it. *(See illustration of tile kiln, above.)*

Despite all the issues mentioned above, ground penetrating radar has been used successfully to record hidden building details such as chimney flues

No published report has been discovered of any successful attempt to map plaster survival using ground penetrating radar. There are likely to be two technical reasons for this :

i The equipment in use is not capable of resolving detail to sufficient accuracy to discriminate between layers of plaster.

ii The equipment is too bulky and cumbersome to allow easy and accurate positioning within a church, especially where delicate decoration is present.

9.5 Non-destructive survey : Ultra violet light photography

Ultra-violet light is an electromagnetic wave ranging in frequency from about 1 x 10^{-9} metres to 400 x 10^{-9} metres. In other words, ultra-violet frequencies occupy the bands between visible light and the start of the X-ray spectrum.

Dorrell suggests two applications of UV photography that might be useful in detection of overskimmed wall paintings,

> *" There are two quite distinct ways... . One is direct UV, or UV reflectance, where what are recorded are the UV rays reflected from a surface; the other is UV fluorescence, where the camera records the rays that reach the surface as UV but are reflected as visible light." (Dorrell, P., 1989, p.199)*

Of the two, he suggests that only the latter, fluorescence, is of real value.

Dorrell discusses the limitations of the technique as follows,

> *"With UV fluorescence photography, what is being recorded is not the UV reflected from the surface, but reflected visible light resulting from UV rays that reach the surface but are reflected back as radiation of longer wavelengths... . Fluorescence in the visible spectrum can be of different colours depending on the substance being excited, and these colour differences, and their intensity, have been successfully used in non-destructive analysis of minerals and pigments... . In the conservation of paintings, UV fluorescence has long been a standard tool for the detection of overpainting, retouching and past restoration. ...attempts have been made to utilise it in the study of cave paintings - not entirely successfully, since the subsequent deposits that may mask the paintings are nearly always of calcium carbonate, which itself fluoresces strongly and further obscures the painting." (Dorrell, P., 1989, p.201)*

The difficulties discussed above, together with the fact that this project is primarily concerned with the discovery of plaster rather than wall paintings, have meant that UV photography has not been explored further as part of this project. However, there would seem to be a strong case for experimenting with its use in conjunction with infra-red and ultra-sound as part of further research.

9.6 Non-destructive survey : Computer enhanced photography and Photogrammetry

Photogrammetry is the process of producing survey drawings by synthesising the data from a matched stereoscopic pair of photographs. It is the technique used by the Ordnance Survey to create the contours on national mapping. Theoretically the same technique could be applied to 'contouring' wavy medieval plaster surfaces. These contour plots could then provide an objective means of discriminating between plaster surfaces. However, there would be considerable practical difficulties. Successful photogrammetric plotting is not an automatic process. Considerable operator skill is required to accurately interpret the stereoscopic photographs, and it is debatable if such skill exists. Wood reports significant difficulties with photogrammetric plots of masonry at Brixworth church and Exeter Cathedral *(Wood, J., 1994, p.137)*

The undulations of a wavy plaster surface represent a level of difficulty, for the plotter, of a different order of magnitude to those posed by contouring maps or picking up the outlines of stones on the west front of a cathedral. The definition of a wavy plaster surface may involve surface variations of only a few millimetres *(See profiles presented in chapter 7.5.2.3)* and photogrammetry is unable to resolve such small variations reliably.

A most intriguing reference is made by David Parsons and Christopher Brooks in Buildings Archaeology : Applications in Practice *(Wood, J.,1994, p.140)* to recording by image enhancement photography. The following photographs are used to illustrate a technique that would appear to be very useful for plaster survey :

Figure 68

"Figure 10.2: Laxton (Nottinghamshire); south wall of the chancel prior to cleaning, as seen by the naked eye; faint traces of lettering are discernable (CJ Brooks)" (Wood, J., 1994, p.140.)

Figure 68 (continued)

"Figure 10.3; Laxton (Nottinghamshire); south wall of the chancel as recorded by image enhancement photography, revealing the nature and extent of the painted decoration (C J Brooks)" (Source : Parsons, D ., and Brooks C., in Wood, J.,1994, p.140)

The original published quality of these photographs is so poor that it makes any conclusions very tentative.

However, there are clearly issues to be addressed. The upper image in *Figure 68* (10.2) is said to be *"...prior to cleaning, as seen by the naked eye". (Wood, J., 1994, p.140)* Leaving aside the fact that it has been seen by a camera and not by a naked eye, the key part of the caption is the mention of cleaning.

How far is the revelation of the lettering in the lower image in *Figure 68* due to cleaning and how much is due to computer image enhancement? There would seem to be a mysterious hazy quality around the area of visible lettering that could be explained as the remains of the limewash that had been cleaned from the lettering in the centre of the photograph. If this explanation is correct, it is not obvious what the role of computer enhancement may have been.

Time and technical developments have been unkind to earlier books on archaeological recording. The contrast/contour enhancing imagery described by Brooks *(Wood, J., 1994, p.141)* is now available via digital cameras and almost any photograph handling programme. *(For example, Adobe Photoshop.)*

Contrast and colour enhancement have been employed on most of the photographs of wavy plaster used in this project. For example, this image of plaster at Whitcombe *(Figure 31)* appeared thus when first downloaded from the digital camera :

Figure 69

Whitcombe wavy plaster before (left) and after (right) adjustment of colour, brightness and saturation.

After adjustment of contrast and brightness, the apparent waviness of the plaster is greatly enhanced. *(Figure 69)*

Internet searches have revealed that numerous commercial companies (*for example AutoFX, AutoEye and Extensis Intellihance Pro, all accessed during March 2005*) offer image enhancement software that uses patented algorithms to automate and standardise the enhancement process. It is not clear that these programmes offer any significant advantage over general purpose image manipulation software such as *Adobe Photoshop* or *Corel Photo-Paint.* (The latter was used for this research.) There is undoubtedly further scope for research into image enhancement.

9.7 Non-destructive survey : Infra-red thermography

Infra-red radiation is yet another part of the spectrum of electromagnetic waves, It extends from microwave wavelengths at around 300,000 x 10^{-9} metres to the red end of the visible light spectrum at around 700 x 10^{-9} metres.

Infra-red thermography uses adapted photographic and video cameras to capture images of the heat being radiated by the structure of a building.
It has been extensively and very successfully used to reveal the inner structure of rendered buildings.

Unlike x-rays, ground penetrating radar or ultra sound, infra-red thermography is normally used as a passive recording device. No energy is usually emitted by the survey equipment itself. Instead, the camera or video records energy that has been put into the structure from ambient sources. If conditions are favourable, this ambient energy will be taken up and released at different rates by different materials. Thus, whilst the energy equilibrium is in process of change, the different rates of heat absorption or release will cause different temperatures in dissimilar materials. These can be revealed by infra red thermography.

Figure 70

‘A Saxon chapel’ from promotional material by Robert deMaus.

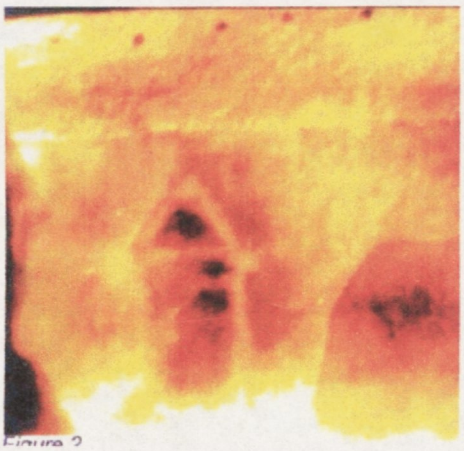


Figure 2

The same wall ‘captured using infra-red thermography

The colours are ‘false’ and are used to represent temperature differences in the materials, and do not represent actual colours of the materials themselves
Darkest colours are the coldest areas
(Source : deMaus, as above)

The same wall after archaeological investigation
(Source : deMaus, as above)

Figure 71

Thermal imaging reveals the inner structure of this old house in Leominster

Interior structure (inset picture) of a rendered building revealed by infra-red thermography.

(Source : deMaus, quoted by Christine Webb in The Times, 12.3.1997)

The reliance on exterior energy inputs is both a disadvantage and a potential advantage.

Four significant disadvantages are :

i Dependency on outside conditions. The camera can only record differences in radiated temperature. Significant differences in temperature only arise only as a result of dynamic environmental change. Long periods of hot dry weather produce structures in hot dry equilibrium. All parts of the internal structure will be as hot as each other and will not be revealed.

ii Unpredictability. Because the data capture relies on external and uncontrolled energy inputs, it is never possible to be certain that no data equates to no hidden structure

iii Blanketing... as Dorrell puts it,

> *"The chief problem still to be overcome is that thermal differences in the atmosphere - particularly in sunlight - completely blanket the surface [temperature] differences." (Dorrell, P., 1989, p.204)*

iv Cost. Infra-red film stock is expensive, as is its processing.

Against which can be set three advantages :

i Quick and easy when conditions are favourable.

ii Cheap when video is used as the recording medium.

iii Good as confirmation of other survey results.

It is theoretically possible to use a pulsed source of heat energy (for example, a Xenon flash) to overcome the difficulties posed by the passive nature of the technique. Energy input in this way could cause differential heating of pigments applied to any plaster layers. This differential heating would then release more heat that could be captured by an infra-red camera. This has been shown to work by revealing darkly pigmented lettering obscured by later paint at the Russell-Coates museum in Bournemouth. However, this result was not the outcome of a planned experiment, and it has not been possible to replicate the results. Whether sufficient energy could be input to penetrate Victorian overskim is very doubtful. Additional field trials by Robert deMaus suggest that results can be very clear, but that success is unpredictable. *(deMaus, R., 2005, pers.com.)*

It is possible that this success could be replicated to reveal areas of overskimmed medieval plaster. Given suitable weather conditions, different areas of plaster could acquire significantly different moisture levels. Areas with a high moisture content should warm and cool more slowly than drier areas. If the survey was conducted as ambient temperatures were changing, wetter and drier areas should be revealed. It is possible that the differences in moisture content might directly equate to changes in the number of plaster layers.

There does not appear to be any published discussion of the potential for using infra-red thermography to investigate wall surfaces as opposed to hidden structure. The limitations of this project have prevented practical experiment. An interesting development of the project would be to integrate infra-red thermography with ultra-sound.

9.8 Non-destructive survey : Micro drilling

A technique introduced into conservation by Robert deMaus, and now widely adopted for the survey of structural timbers. A steel needle is rotated and forced into the material being tested. A real-time paper or digital trace of the needle's speed of penetration is made. Since the drill is held steady and the force driving its penetration is constant, the speed of penetration is analogous to the hardness and density of the material being drilled. The technique is particularly successful in revealing voids in large timbers. Though it has yet to be seriously attempted, it would seem plausible that the technique could be adapted to reveal the density changes that occur at the junction of plaster layers. There is definite scope for further research into the application of this technique.

An obvious disadvantage is that the technique is not strictly non-destructive. When testing worm-eaten timber another 3 mm. Hole is not visually significant. On a plain plaster wall, and array of such holes would be very obvious. It is also possible that the mechanical stress caused by the drilling might detach plaster layers, one from another.

9.9 Non-destructive survey : Ultra-sound.

9.9.1 Introduction and basic principles

Sound is a series of pulses of energy, or a vibration, that can pass through any solid, liquid or gas. It takes the form of a longitudinal wave, but is not related in any way to transverse electromagnetic waves such as light or x-rays. *(Bushong and Archer, 1991, p.1)*

Ultra-sound is the name given to the range sound frequencies that run from just above the threshold of human hearing at 20,000 cycles per second (20 KHz up to 10^7 KHz.)

Ultra sound is unique among the currently available non-destructive survey techniques because it has direct parallels in the natural world. Dolphins and bats, for example, both use ultra-sound to navigate and find food. *(Bushong and Archer, 1991, p.1)*

Ultra-sound has been in use as a survey tool since the early part of the twentieth century. It was instrumental in the Second World War as the ASDIC system for locating submerged submarines. This has been greatly refined and developed as sonar. *(ultrasound info.net, accessed March 2005)*

The basic principles of ultra-sound are threefold, and are illustrated schematically in Figure 72, below : *(deMaus, R., 1994-2005 pers.coms.)*

Principle one :

All sound, including ultra-sound travels at different speeds in media that have differing structures and densities. Dense hard materials, such as metals, transmit ultra-sound more rapidly than less dense, porous materials such as stone, timber and plaster *(ultrasound info.net, accessed March 2005)*

Principle two :

When ultra-sound is transmitted through materials, substantial changes of density will slow the transmission the speed of ultra-sound pulses *(ultrasound info.net, accessed March 2005)*

Principle three :

Whenever transmitted ultra-sound crosses a boundary between substantial changes in density, an echo of the ultra-sound pulse will be reflected back towards the transmitter. *(ultrasound info.net, accessed March 2005)*

9.9.2 Ultra-sound applied

The simplest application of ultra-sound contains five processes *(See figure 72, below)* :

i A pulse generator which sends an electrical signal to a transducer (transmitter).

ii The transducer converts the electric pulse into an ultra-sound sound pulse.

iii The sound pulse travels through the material (or is reflected by its internal structure) and is collected by a receiving transducer and reconverted to an electric pulse.

iv The transmitted or reflected pulse of ultra-sound is collected received by a receiving transducer and converted to an electric pulse. This is fed back to a receiver, which can be very sophisticated and programmed to reject unwanted noise.

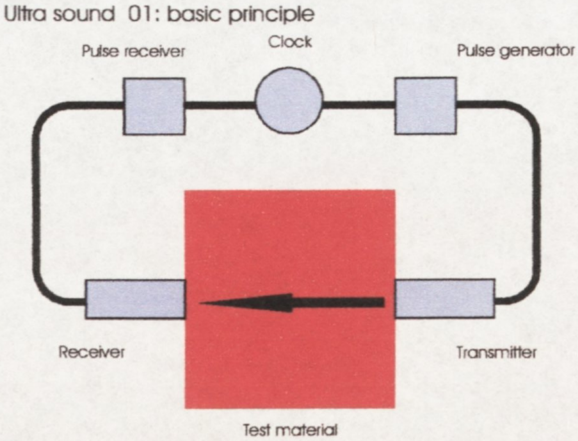
v A clock records and compares the time elapsed between the generation of the pulse and its return. This data can be displayed at its simplest as a numeric value, which can be manually compared to reference values. Alternatively the raw time delay data can be processed by software and displayed as two dimensional screen image.

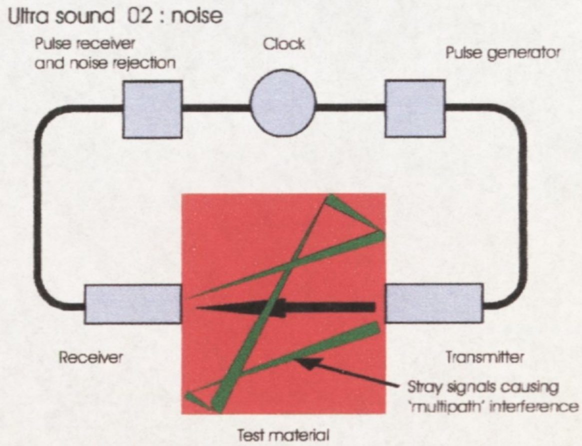
This relatively simple processing cycle relies on *principle one* (above). It is widely applied in materials testing ultra-sound applications, though does not have direct utility for this project. Since no collection of reference data exists for the transmission speed of ultra-sound in wall plasters, the simple elapsed signal time is impossible to interpret.

Principles two and *three* allow considerably more sophisticated data to be gained. *Principle two*, with suitable interpretation software, should allow discrimination between layers of plaster that have different densities.

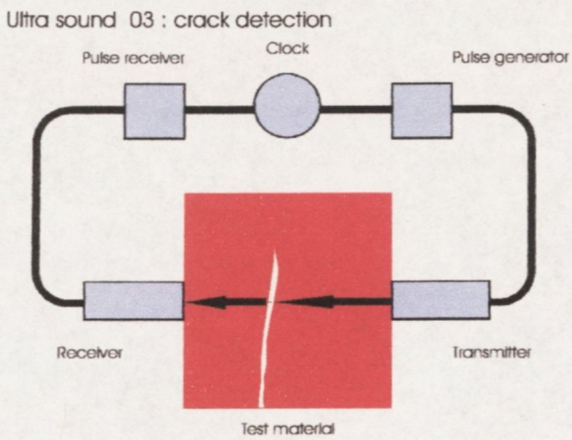
Principle three allows the surface of overlaid plaster layers of different densities to be imaged via software.

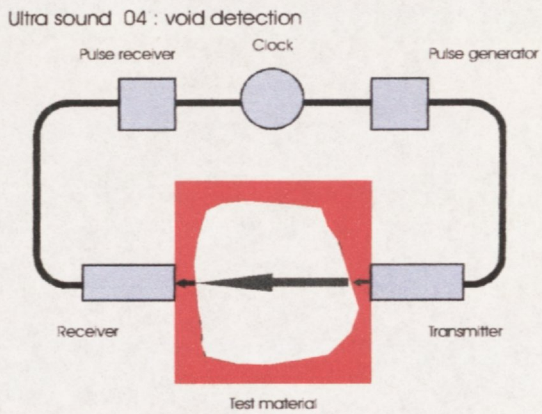
Figure 72

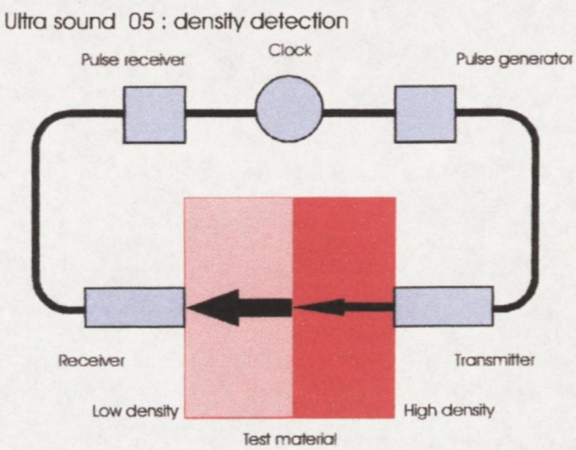


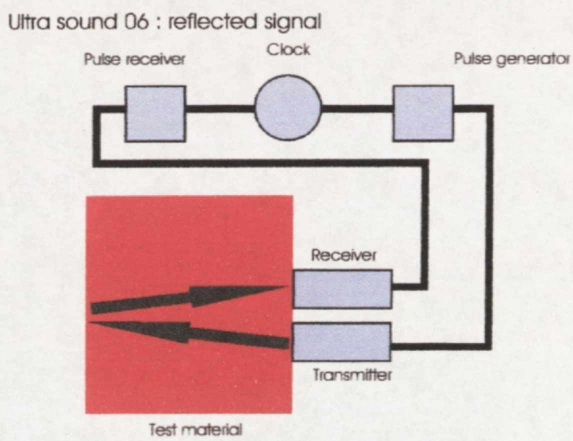


As well as the 'stray' signals reflected from the internal surfaces of the sample, there can be a significant surface effect, where pulses from the transmitter reach the receiver by travelling across and around the sample rather than through it.









9.9.3 Frequencies

Though it is possible to utilise ultra-sound over a very wide range of frequencies (20 KHz to 10^7 KHz) the most commonly used frequencies outside the medical field appear to be 50 KHz and 200 KHz. *(Airmar technical literature, 2004-5, passim., Garmin technical literature, 2004-5, passim., deMaus, R., 1994-2005, pers.coms., Bhardwaj, M., 2005, pers.com.)*

Altering the transmission frequency has significant effects on two aspects of ultra-sound survey :

i Higher frequencies can carry more energy with less amplitude. Since amplitude is limited by the power of the equipment and by potential risk of damage to the plaster, 200 KHz should give better penetration and stronger reflection from layer surfaces than 50 KHz.

ii Plaster is usually a complex heterogeneous mix of materials with widely differing densities. It is not known how this mix will tend to scatter and absorb the ultra-sound beam, but changing the frequency could impact significantly on how the ultra-sound energy is transmitted through the plaster.

Available transducers, in practice, have limited this project to experiment with 50 KHz and 200 KHz. This limitation may have little scientific basis, and research into varying the frequency used should be central to any further investigation.

9.9.4 Transmission

This project has attempted to adapt commercially available fishfinding sonar to detect hidden plaster layers. *(See below, chapter 10.)* Adapting the transducers that emit and receive the pulses of ultra-sound energy, has proved the most problematic issue. The transducers supplied to work with fishfinding equipment, are designed to work in water. Transducers capable of working in air are available, but advice from the manufacturers

(Airmar Technical Support, January 2005, unsigned email reply.) strongly suggested that they would not be compatible with standard fishfinding software. Exploratory contact with Dr. Mahesh Bhardwaj of the *Ultran Group* has suggested that non-contact ultra sound systems could be adapted to search for plaster. Such systems use high power transducers that can transmit and receive even when held in air a short distance from the test surface. The issues raised by the adaption of transducers designed for water immersion is more fully explored in chapter 10.

9.9.5 Calibration, software and imaging

Though a wide variety of software and display equipment has been developed by an equally wide variety of manufacturers, it is unclear how far different systems share hardware and software components. This project has had neither the resource not the expertise to reverse engineer the software included with fishfinders to analyse how it could be adapted or improved to aid plaster location. This is a potentially rewarding area for further research.

Ultra-sound has developed in four main fields, materials testing, flow measurement, medical imaging and underwater detection systems (sonar). Though the physical principles are the same, regardless of application, the different fields have developed widely differing equipment and software. These are briefly review below to assess their relevance to this project.

9.9.6 Materials testing.

A substantial technical literature exists. *(e.g. Fromme, P., and Mahir, B.S., 2002, p.199-203., Ultrasound info.net, passim.)* This is generally very application specific (e.g. Crack detection in metal components) and there appears to be almost nothing relating to historic plaster. This is not to say that no literature exists, but rather to acknowledge how difficult it is to locate. For example, Carlo Bertelli's article on the conservation of *Leonardo daVinci's "Last Supper"*, which in the National Geographic Magazine *(Bertelli, C., 1983, pp.664-685.)* contains a most intriguing statement :

> *"Using ultrasound, we have made a profile of the thickness of the wall at some 200,000 different points. We can resolve differences in thickness to a tenth of a millimetre. This lets us find little craters and pick out places where the priming is lacking and only the bare wall remains." (Bertelli, C., 1983, p. 683.)*

It has not been possible to find any further details.

Despite its relative lack of sophistication, much of the equipment in this category is very expensive *(Internet searches, May 2004- June 2005.)* This is most probably due to non-technical issues such as low volume production and fears over product liability issues. Two manufacturers were contacted by email to discuss costs. Neither responded.

A relevant and interesting development of materials testing ultra-sound has been pioneered by Robert deMaus *(deMaus, R., 1994-2005, pers.coms.)* He has used the simplest form of signal delay measurement ultra-sound to test for voids and decayed areas in structural timbers. By comparing reference data for timber known to be in good condition against that produced by that under investigation, it has proved possible to reliably locate areas of woodworm damage. *(See ultra-sound diagrams, above.)* He has also successfully applied the technique to void detection in masonry. DeMaus has primarily used transmitted rather than reflected ultra-sound. *(See ultra-sound diagrams, above.)* This means that his techniques are probably not directly applicable to plaster detection, where it is the multiple reflections from multiple plaster surfaces that are needed.

deMaus has engineered an elegant and simple solution to one practical ultra-sound problem. It is necessary to make acoustic contact between the receiving and transmitting transducers and the material being tested. Medical ultra-sound operators use water based gel to do this, but such gels would be likely to damage the surface of historic building materials. DeMaus has found that "Blu-tak" (see glossary) works acceptably. This is discussed further in chapter 10, as even "Blu-tak" is probably too aggressive to be used on church plaster.

9.9.7 Flow monitoring.

A vast array of industrial processes are now fully automated and this has been partly made possible by the automatic monitoring of liquid flows. Ultra-sound can be used to do this because of a phenomenon known as the Doppler effect. When ultra-sound pulses of a given frequency are reflected from a moving surface, the frequency of the echo is changed in proportion to the speed of the movement. An everyday example of the Doppler effect is the apparent change of note from the air horn of a moving train. As the train approaches, the note apparently rises. As it passes and recedes, the note deepens.

Since it is hard to image a more static test sample than medieval church plaster, Doppler effect applications for ultra-sound do not appear to have any relevance to this project.

9.9.8 Medical imaging.

Medical imaging ultra-sound uses very sophisticated software to analyse the echo returns from each ultra-sound pulse. These returns are used to generate a two dimensional image of the examination area.

There is little doubt that medical ultra-sound equipment, particularly the imaging software, provides the most potentially suitable means of surveying for old plaster. The sensitivity, controllability and display potential are all far superior to those available in any other application. The chief power of medical ultrasound scanners lies in their noise rejection software. This removes unwanted and meaningless echo returns from the display and allows the creation of an image that can be relatively easily interpreted. It seems likely that the variable densities found in body tissue would produce noise problems very similar to those produced by plaster.

However, resource constraints have meant that this project has not been able to adequately follow up the possibilities.

Considerable attempts were made to cultivate contacts with access to suitable equipment with a view to testing samples. Understandably, perhaps, these attempts were unsuccessful. The medical profession are rightly concerned to maintain the cleanliness of their equipment, and those contacted did not consider the introduction of mortar samples consistent with good medical hygiene!

Enquiries were also made as to the cost of new equipment. These were not pursued after it became obvious that no equipment was within the budget of this project. It is unclear why medical ultra-sound equipment is so expensive. The most likely reasons are that production volumes are very low, and that product liability issues are a source of much expensive litigation. Informal contacts with potential suppliers left an uneasy feeling that the market in medical electronics is not without a measure of restrictive trade practice.

Further extensive enquiries were made to try and locate obsolete medical ultra-sound equipment. These failed because the equipment is currently too valuable to ever be considered redundant. Apparently, a substantial trade exists exporting used medical technology of all descriptions to less developed nations.

A very extensive literature exists on the technical aspects of medical ultra-sound and also on its safety and utility. There does not appear to be universal agreement on the safety of medical ultra-sound. The argument over safety is focused on the danger to the patient being examined with ultra-sound, and not on the operator using the equipment. This project has not found any published proof that any commercial application ultra-sound is dangerous to the operator.

9.9.9 Sonar.

Sonar is the application of ultra-sound to underwater survey and detection systems. By far the largest research and development appears to have been in the military field. Searches for descriptive literature yielded a strong suggestion *(Internet, 2005)* that much basic research is still classified as militarily secret.

Fortunately for this project, military research on sonar has been extensively adapted to the design of fishfinders.

Fishfinders use standard, water immersion, ultra-sound transducers connected to software designed to discriminate between the ultra-sound echoes returned by fish, and those from other underwater objects. The software is packaged with high resolution display screens, and offers a range of controls over sensitivity, gain, and noise rejection. (See chapter 10.)

Despite extensive searches, no literature has been found on the adaption of fishfinders to alternative uses. Manufacturers are all concerned with product liability issues, and initial contacts with the customer service departments of two major companies (*Garmin* and *Eagle*) produced unhelpful responses. In the words of one :

> *"Our fishfinders are for finding fish. Period." (email from Garmin technical department, January 2004.)*

However, direct personal experience of units in use, showed that fishfinding sonars are capable of discriminating between multiple layers of sediment on the sea floor.

Herein lies the reason for pursuing experiment with fishfinders. If they can discriminate between sediment layers of differing density, it was plainly possible that they could discriminate between multiple layers of plaster.

9.10 Summary and conclusions.

It is certainly very tempting to believe that introducing machines in to the survey process automatically makes the output more objective, but it is probably an illusion to think that any survey method is wholly objective. The laptop on which this project has been produced is a good example. It has codified and organised the authors output and allowed it to presented with more typesetting skill than could be managed by a roomful of printers devils... but it has done nothing to rectify any faulty logic. In other words, surveying with machines is bound by the same famous law as are computers : *garbage in - garbage out.*

All that can be realistically expected from the application of machines to the survey of Dorset church plaster is an *improvement* in the objectivity of the survey results.

Even though machine aided survey should allow the surveyor to see buried material, specifically layers of medieval plaster that have been overskimmed by Victorian restorers, this has yet to be proven. It may prove that a combination of trial sampling, as well as machine aided survey, will be the only way of discriminating reliably between multiple layers in modern plaster and the overskim of medieval plaster.

In light of the discussion above, fishfinding sonar has been chosen as the most suitable technique for further experiment :

i It is light, robust, available and relatively cheap.

ii It has integrated software that is proved to be able to discriminate between layers of sediment on the sea bed, a function very similar to that required for this project.

Contrast enhanced imaging (CEI) does not appear worthy of further discussion as a specific technique because it has become an integral part of general image capture and processing. It would be simply incompetent to produce produce photographic survey data without enhancing the images.

In conclusion, the various available techniques can be listed :

i X-ray. Cost, danger and complexity of the equipment are the main reasons for not researching this technology further.

ii Ground penetrating radar. Cost, bulk and poor image resolution make this technique highly unlikely to produce useful results.

iii Infra-red thermography. This technique might well be a useful method of investigation, especially when used in conjunction with ultrasound. Only the time and resource constraints of the project have prevented experiment with this technique.

iv Industrial ultrasound. Crack detection ultra sound is focused on applications where transmission speeds are known and constant. It is unlikely that the simple (if expensive) equipment used could be adapted to the complex noise rejection needs of plaster survey. However, preliminary contacts with Dr. Mahesh Bhardwaj the head of research at the U.S.A. Based *Ultran Group* suggest that new technologies are emerging that will allow the adaption of ultrasound currently used for the testing of concrete. This is further discussed in the chapter 11.

v Medical ultrasound. This is sophisticated robust and very well documented. There is little doubt that medical ultrasound scanners could be used without modification to accurately discriminate between layers of plaster. There is a strong possibility that they could be used to map substrates below the plaster. However, this project has not been able to experiment with medical ultrasound because of its very high cost.

It should not be inferred that these technologies have nothing to offer, merely that there has not been time and resource within the project to follow them up in detail.

After weighing up the advantages and disadvantages listed above, it was decided to experiment with the practical adaptation of fishfinding sonar. This is described in detail in chapter 10.

10. Ultrasound applied

10.1 Introduction

This chapter attempts to demonstrate that cheap and robust fish finding equipment might be adapted to produce useful results in the search for medieval plaster. Chapter 11 deals with the scope for further research implicit in the trials discussed here. There is clearly a need to develop the introductory work done here, by research whose resourcing will allow a high level of rigour and elegance. In the meantime, this chapter, from a scientific standpoint, is intended to be seen as a starting point.

10.2 Fishfinders.

Numerous makes and models of fishfinding sonar are currently available. There is a very large commercial and sport fishing market for these products, which has allowed high volume production to reduce costs to low levels.

Market place research revealed that the two most widely available product ranges were *Eagle* and *Garmin*. Both manufacturers offer extensive product information on their web-sites. This was searched to try and determine which units offered the most sophisticated software for bottom analysis. (Bottom analysis was assumed to be the function most akin to that of discriminating between plaster layers.) Neither manufacturer was willing to respond to requests for more detailed information, so on the basis of the published data, it was decided to opt for the *Garmin 250c.*

The *250c* appeared to offer significant software and display advantages over other units in its price range. In particular, it features *whiteline technology*. This is described by the manufacturer :

> *"Whiteline - controls how the unit displays information about the bottom type (hard or soft). With the Whiteline Off, all high-intensity bottom returns are displayed as*

red... . With Whiteline set at Normal or 1-100%, this option can be used to better determine the bottom hardness." (Garmin Owners Manual, p.14.)

The *whiteline* feature did significantly enhance the results obtained. *(See below)*
No research has been undertaken to compare the performance of different makes and models of fishfinder. It is entirely possible that much better results could be obtained using alternative equipment. On the other hand, it is very possible that different manufacturers and models all share the same chip-sets and software. It would be very interesting to reverse engineer several units with a view to improving their software specifically for plaster layer detection. This should be a priority for any further research.

10.3 Trial design

The aim of the trial was to determine if a standard, commercially available fishfinder could be used to discriminate between plaster layers.

The major practical problem was the adaption of the transducer from in-water to in-air use. This was approached by using the standard transducers in their native environment. In other words, the environment of the plaster has been adapted to suit the equipment, rather than adapting the equipment to the normal environment of plaster. It was the doubt that the standard transducer would produce any result, even in its native medium, that led to the adoption of a water based environment for the trials. The consequences of this approach are potentially significant.

By placing the test samples in a tank of water, so that the transducer was in its native environment, it is probable that the ultra-sonic behaviour of the *plaster* has been altered. It may have been *so* altered that it no longer constitutes a useful analogy for plaster on church walls. Ways of addressing this possibility in future research are discussed below.

Two trials were conducted, (i) the tank trial and (ii) the pipe trial.

i The first trial, or tank trial, involved placing combinations of plaster samples into a large, water filled tank. There was no attempt to produce a test rig that could be moved or used in the field. This cautious approach was bred out of real fears that the trial would prove that fishfinding sonar would not work at all as plaster survey tool.

ii The second trial, or pipe trial, made some attempt to reproduce the reality of plaster survey by reducing the equipment down to transportable size. Aside from this consideration the equipment used in the second trial has no other significance.

10.4. Tank trial.

10.4.1 Aims

The two aims of the trial were to :

i Assess whether any useful data could be gathered from the use of the fishfinder.

ii To explore the software supplied with the basic sonar unit to establish if a useful, immediate graphical display could be reliably generated.

10.4.2 Trial design

Details of the trial design are included in chapter 14.1. *(Appdencies)*

10.4.3 Results and interpretation

The trial did produce significant data, though the interpretation of that data is open to substantial argument.

The graphic display produced was reasonably stable, and did produce banding that appeared to form an accurate, scaleable image of the thickness of the plaster samples.

However, adjustment of the controls to facilitate the best possible image, frequently introduced random effects into the display. These could not be analysed or explained within the structure of the trial, and thus introduced a level of uncertainty into all the data. It seems quite possible that the operating environment was introducing resonances and reflections of the ultra-sound impulses that could not be be correctly processed by the software.

Figure 73:
Fishfinder tank trial results.

The large figure (0.8^{m}) represents the distance between the transducer and the bottom of the tank and is accurate to approximately 20 mm.

The blue, green and brown bands probably represent the three plaster samples stacked in the bottom of the tank.

The red bands probably represent the bottom of the tank, and possibly the surface of the yard beneath it, but this interpretation is open to debate.

(For details see chapter 14.1, Appendices.)

10.5 Pipe trial

The test tank trial proved that useful data could be produced by fishfinding sonar. This second trial used the same sonar equipment placed into a new environment. Full details are in chapter 14.1. *(Appendices)*

10.5.1 Aims

The aim of this trial was to demonstrate that useful sonar data could be produced by a test rig that was capable of being adapted for use in the field.

10.5.2 trial design

It was felt necessary to continue to operate the transducer in a water environment, as to operate in air might introduce an unpredictable set of new variables. Creating a water based environment for the transducer that was both portable and sufficiently self-contained to be used on real church plaster posed three questions:

i Was there a minimum distance between the transducer and the plaster being examined?

ii If a portable, narrow tube was used to provide the necessary water environment for the transducer, would the internal surfaces of the tube interfere with the sonar image by introducing unpredictable stray echoes?

iii How could the end of the tube be sealed in such a way as to allow unimpeded passage for the ultra-sound into a plaster surface, whilst simultaneously preventing the test plaster becoming wet?

With the gift of hindsight, it seems certain that the mind-set, of needing to operate the transducer in water, lead to a trial design that would be very hard to adapt to practical use. The results of the trial itself, and subsequent discussions with Robert deMaus *(deMaus, R., 2005, pers.com.)* have suggested a number of alternative strategies. These are discussed in below. *(10.6)*

10.5.3 Results and interpretation

As with the tank trial, the test equipment did appear to successfully discriminate between the plaster layers and the lead at the bottom of the test pipe. *(See chapter 14.1)*

The displayed thickness, density (as a function of the strength of sonar return), and distance from the transducer were all broadly accurate throughout both trials. In other words, the equipment detected overskimmed layers of plaster, and produced sufficient data to suggest that the hidden layer had a significantly different density to that covering it. *(See chapter 14.1)*

In both trials the filter controls and the choice of frequency appeared to play a significant part in determining the quality and utility of the image displayed. Neither trial can claim to have exhausted the permutations of available settings. *(See chapter 14.1)*

However, neither trial succeeded in obtaining completely stable results. Though it was broadly possible to replicate the screen display in separate sessions using the same control settings, there were always slight differences. Similarly, in either trial, if the display were left running (scrolling) for more than a few minutes, instabilities would appear. It is presumed that these are generated within the mathematics used by the software to produce the graphic display. *(See chapter 14.1)*

The key weakness of the trials is that there is no certain way of interpreting the graphic data they produced. There are certainly coloured bands that may well represent the plaster samples, but the trials do not provide proof that this is the case. This does not mean that the aims of the trials were not achieved, merely that further work needs to be done.

10.6 Discussion and future possibilities

Discussions with Robert deMaus, conducted after the trials had been completed, have challenged the whole concept of using a transducer in a water environment.

This is not to say that trialling with the transducer in its native environment was completely in error. The initial tank based trial was a logical way of reducing random variables by keeping as closely as possible within the usage parameters envisioned by the equipment manufacturers. In other words, the equipment was proven to function correctly in a fishfinding environment. If that environment were reproduced, the subtleties of sonar returns from plaster samples should be akin to those returned from the sea bed, and be within the software capabilities of the equipment.

The pipe trial, with hindsight, was less elegant. It certainly demonstrated that results could be obtained with samples of realistic thickness, and equipment that could be made portable. However, three key issues were not addressed:

i The mortar samples were contained within the same water environment as the transducer. This meant that they were effectively saturated. The trial yielded no data on whether saturated plaster gives sonar returns that are analogous to those generated by dry plaster.

ii The practical problem of containing the water environment, but still offering a direct ultrasound path from the the transducer to the plaster, was not addressed. In other words, how is the end of the tube containing the water environment to be sealed so that it can still allow the water inside to make intimate contact with an uneven plaster surface? One possibility would be to cover the plaster end of the tube with a thin and flexible membrane, but this was not researched.

iii Did the transducer need to be operated in a water environment at all?

This last issue was the one most challenging to the design of the pipe trial. The work of deMaus, using industrial crack detection equipment, seems to suggest that a way could be found of achieving satisfactory contact between the transducer and the plaster *without* the need for water. deMaus has had success using "Blu-tak" *(See glossary)* as a contact medium. *(deMaus, 2005, pers.com.)* This would not be appropriate for church plaster as it would leave stains, and might well adhere too strongly to be removed without causing damage. The standard approach of the medical world, using a water based gel to give a good ultrasound path from the transducer to the test subject, is again inappropriate for risk of staining.

A possible way forward might be to mount the transducer into a block of highly plastic material, that would conduct ultrasound as effectively as a gel, and be able to intimately conform to a plaster surface without staining or damaging that surface. Very limited enquiries suggest that such materials are available (for example, silicone rubber). Any further work should research the availability and effectiveness of such materials.

With one last shaft of hindsight, it is questionable if this attempt to trial the plaster finding potential of inexpensive fishfinding sonar should ever have formed part of this thesis. The weakness of the trial data is, to a large extent, a function of inadequate time and resource in a project that was already overloaded with primary data. Nevertheless, even if nothing is proven, there is a strong suggestion that ultra-sound offers a way forward in detecting hidden plaster layers. This is more fully discussed in chapter 11, Conclusions.

11. Conclusions and recommendations

11.1 Conclusions : Successes and failures of the research

At the beginning of the project, several cynical observers suggested that the it would create more questions than it answered. They were, of course, right. The initial four assumptions were that :

i Dorset would have relatively architecturally modest churches,

ii there would be a relatively small number of churches,

iii most of these churches would have been thoroughly restored and thus have lost t heir medieval plaster, and

iv surviving plaster was already recorded.

All these assumptions were disproved by the survey data.

Instead of supporting the initial assumptions, the survey data produced two great surprises :

i The two most well known and influential secondary sources on historic buildings in *(Pevsner, N., 1972, passim. and the Royal Commission on Historical Monuments, 1952-75, passim.)* had not really considered the survival of plaster as an issue of significant historical interest. Indeed, their treatment of even painted plaster is superficial when compared with that of most other aspects of historic buildings, for example, church plate or carved stone details.

ii That Victorian restorations were not predictable in their scope and thoroughness. With hindsight, there is no reason why the Victorians should always have stripped old plaster before applying new, but this author shared the common assumption that they had. Where Dorset churches were re-plastered during restoration, the evidence of this project is that complete plaster stripping was far from universal.

One aspect of the survey data generated no surprise. It was anticipated at the outset that visual survey would present problems of objectivity. It did. The wavy plaster surface that characterises much early plaster was found, as anticipated. However, also found in significant quantities were plaster surfaces, (for example, on the north nave wall at Loders) *(See photographic evidence, chapter 15)* that might be wavy enough to be medieval... or might equally well be less than perfect Victorian work. This difficulty compounded a weakness in the initial design of the survey and is further discussed next.

11.2 Measuring waviness

The survey relied almost exclusively on visual evidence to characterise wavy plaster, on the assumption that the resulting data would primarily be presented using photographs. At a very late stage in the production of this thesis, it became evident that this style of presentation would not be entirely self-supporting and would require support by quantitative data. Had the survey been designed from the outset to collect numerical data, such as that presented in chapter 7.5.2.3, a very different project would have resulted.

There is considerable scope for future work to be done on automating and accelerating the gathering of numerical data. It is suggested that this, together with work on ultra-sound should form the basis of future research.

11.3 The extent of survival

As noted above, the extent of plaster survival was not anticipated. Although no exact number of survivals had been predicted at the outset of the survey, that thirty eight churches were discovered to hold plaster survivals came as real surprise.

Though any estimate of the area of plaster survival can only be tentative, what is certain is that much more has been proved to survive than realised any by previous commentator. This is a significant contribution achieved by this work.

11.3.1 Visible survival : waviness

As with the survival of plaster in general *(above 11.3)* the survey of plaster with a wavy surface was successfully addressed by the survey. However there is a limitation. The key tool used by the survey to determine if unpainted plaster was medieval in origin was to visually examine its surface for waviness. This approach generated a large volume of useful data, but did not produce a measure of how much wavy plaster survives. In other words, although survival was noted on a church by church basis, no attempt was made to even estimate the areas involved.

11.3.2 Overskim

The survey successfully identified, on a church by church basis, where early plaster was likely to be covered by later overskim. Simply by identifying overskim as a widespread mechanism by which early plaster might be preserved, the project has made a useful contribution. Once again, however, the survey made no attempt to gather data that would allow the total area of overskim to be recorded or even estimated. The same issues apply that are discussed above in *11.3.1* above.

11.3.3 Predicting survival

Even if the project has not defined plaster survival in terms of square metres, it has produced a substantial body of data on how many instances of survival exist in Dorset. In chapter 8 a significant attempt has been made to correlate and analyse this data to see if it can be used to predict the survival of early plaster in other churches. Sadly this does not seem to be possible.

The most likely correlation was assumed to be between the architect involved and the thoroughness of any restoration. However, only the most tentative link is suggested by the data. *(See chapter 12, tables 12.11,12.12, 12.13, 12.14, 12.23 and 12.24.)*

Seven architects were responsible for the bulk of nineteenth century Dorset church restoration. T. H. Wyatt was undoubtedly the worst offender in terms of quantity of plaster lost to one mans actions. However, the picture is more complex than singling out the busiest architects would suggest. Most of the architects responsible for restoring only one or two churches appear to have made up in zeal what they lacked in opportunity. Interestingly, tables *12.13* and *12.14* do show a clear connection between churches where no architect is named in the secondary sources, and where there is surviving plaster. In other words, if a named architect is not associated with a church there appears to be a much greater chance that old plaster survives. This leads to an interesting speculation. Is it possible that the impetus for restoration rarely came from the people of parish, but rather came from expert outsiders (architects) who persuaded parishioners that restoration was what they wanted and needed? Thus, no architect equates to no impetus to restore. In reality the situation was probably more complex than the data suggests. As noted in the discussion of the survey results in chapter 8, The Ecclesiological Movement, the local church hierarchy and the priest will have had a substantial influence over the architect in most cases.

Just as the data supports no strong link between named architects and the extent of plaster stripping, so the data does not allow any clear association between the extent of overskimming and any particular architect.

11.4 Implications for Dorset churches

The results of the survey produce two main implications for the future survey and care of Dorset churches :

i That the there should be a presumption that older plaster exists under nineteenth or twentieth century surfaces, until proved otherwise.

ii That secondary sources should not be regarded as definitive regarding the extent of plaster survival.

11.5 Implications for churches outside Dorset

The general finding of the survey, that more plaster is likely to survive than has hitherto been suspected, is likely to apply nationally. However, as noted in chapter 3.3, considerable caution should be exercised in generalising the the results of this survey to other geographical areas.

11.6 Implications for secular buildings, in Dorset and elsewhere

It is a widely held assumption, among those interested in historical architecture, that churches have been more thoroughly researched than secular buildings. This thesis has produced no data to challenge this assumption. The data from this survey strongly suggests that Dorset churches are not as well understood as had been assumed. This, in turn, suggests that secular buildings are still less well understood and that it is very likely that large areas of early plaster survive but have not been recognised.

11.7 Modifying attitudes and raising awareness

This thesis has made a contribution well beyond its academic purpose. The unexpectedly extensive survival of plaster and the prevalence of overskim have direct implications for any concerned with study of, or care for, Dorset churches. The author will thus seek ways of publishing the survey data in other forms that are accessible to a wide range of other audiences, including :

i County archivists, at the DRO so that a more reliable interpretation can be placed on the material that they hold, such as the notebooks of Sir Owen Morshead.

ii Church authorities, including the Council for the Care of Churches, The Churches Conservation Trust, Archdeacons, Diocesan Advisory Committees, parish priests and church wardens.

iii English Heritage, Historic Scotland, CADW and the Northern Ireland Office of Works *(See glossary)*. These bodies have responsibility for the care and maintenance of many ancient monuments including some churches (for example Knowlton in Dorset).

iv Local authority conservation officers and planners, who do sometimes have responsibility for the care and maintenance of churches, such as the redundant church in Wareham now used as a tourist information office.

v The five Amenity Societies *(See glossary)* who advise local and central government on planning issues relating to listed buildings

vi Grant giving bodies who may financially aid future work in Dorset churches.

vii Specifiers, builders and conservators who are likely to do work in Dorset churches that could threaten the survival of old plaster.

viii The National Association of Decorative and Fine Art Societies (NADFAS), whose members are engaged in an ongoing national church fabric survey.

11.8 Further research

At first glance the link between the visual field survey and the testing with ultrasound seems a little strained.. Why not devote scarce project time to further research into documentary sources, and better explore possible predictive factors for plaster survival. It is true that this needs to be done. It was felt necessary to pursue a means of objective survey because the quantity of probable overskim exceeded all expectations. The need to determine, objectively, whether this apparent overskimming of early plaster really was extensive, overrode the desire to consolidate documentary research. For want of time and resource, the project has not been able to apply the ultrasound method in the field, but has been able to suggest sensible opportunities for further research. Thus for the future, two main areas for research have been generated :

i Documentary research to link architect, parish and contractor information to known restoration outcomes so that predictive models of the likelihood of plaster survival can be developed and tested. The four main areas of study would be the SPAB archive, the notebooks of Sir Owen Morshead in the Dorset Record Office, the Salisbury Diocesan archive, and the Dorset County Chronicle archive held by the Dorset Record Office.

ii Development of practical ultrasound for field trials and the recording of the results obtained to give data quantitative on the survival of early plaster. Any research in this area should be integrated with the work that has been done by Dr. Bhardwaj of the Ultran Group in the United States.

In addition to these main areas, there are many other possibilities. Just two examples are :

i Other areas of Britain and Europe could be surveyed to see if wavy plaster and overskim are as common outside Dorset.

ii Detailed research could be undertaken into the precise sourcing of plaster materials to see if a reference library of attributes distinct to medieval plasters could be developed.

11.9 Summary

The project has achieved its primary aim and demonstrated that pre-Reformation plaster survives in significantly more Dorset churches than had previously been recognised.

The further aim of identifying a sample of churches suitable for further research has also been successfully achieved.

The project has investigated the available options for developing an objective method of surveying for early plaster hidden beneath later overskim, and has done sufficient research to suggest that ultra-sound, possibly used in conjunction with thermography, deserves development into a form suitable for practical field trials.

On balance, the project has not identified a correlation between documentary evidence and the successful prediction of plaster survival. This may be because no such evidence exists, or because another project, solely concerned with documentary research, is sorely needed.

The project has not been perfect, and its deficiencies have been discussed in the text wherever relevant, but it has provided a major contribution to the study of historic churches in Dorset.

The following table gives the achievements of the of the project at a glance :

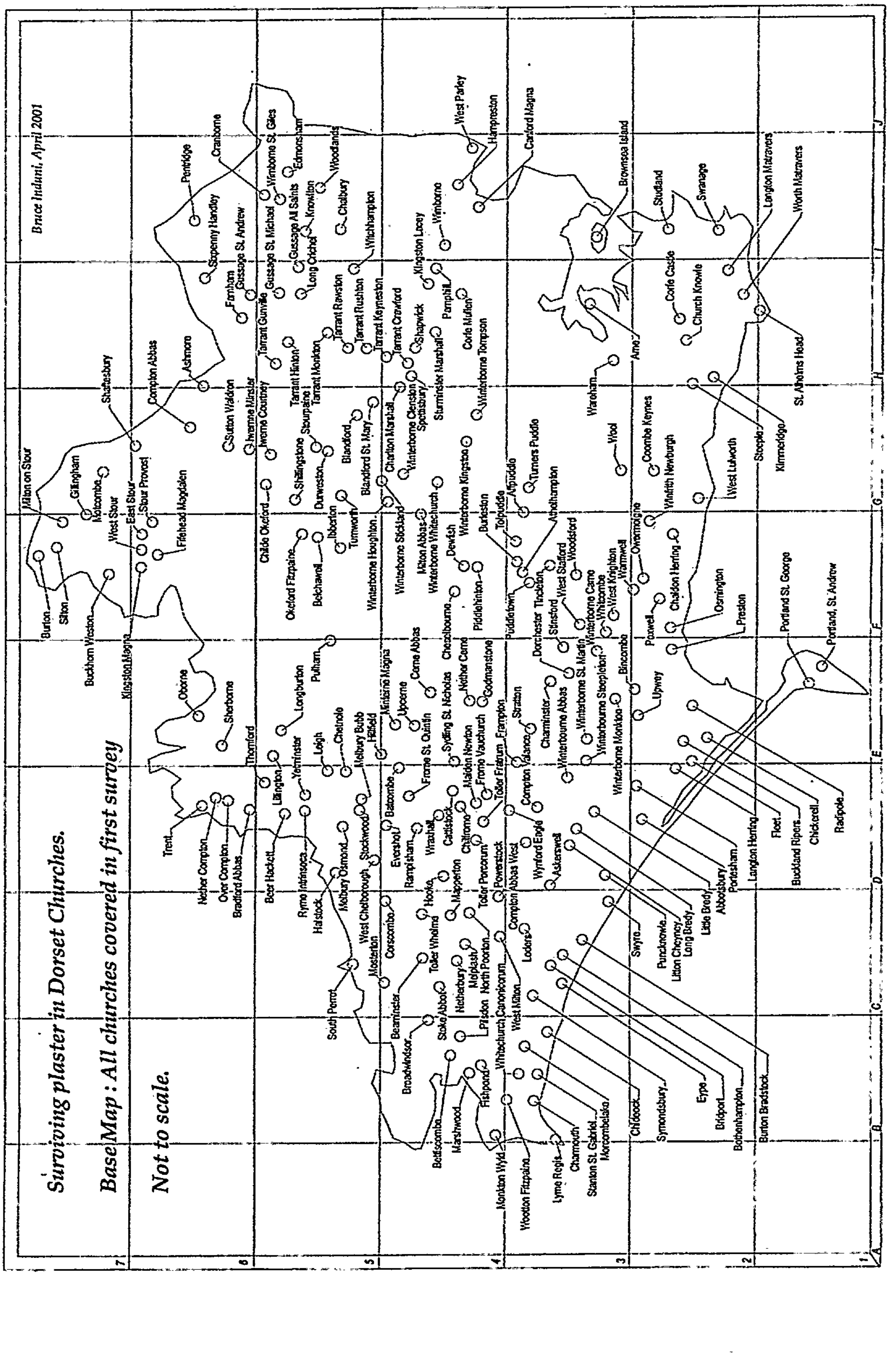
Number of churches surveyed	210
Number of churches found to have surviving early plaster / a possibility of some overskimmed survival	37 / 136
Number of churches found to have overskim probably hiding early plaster	56
Proportion of churches with plaster survival	17 per cent.
Number of churches found to have early plaster that had not been recognised in the secondary literature	26
Number of person hours expended on the project	circa 2,500
Approximate direct costs of the project	circa £2,900

12. Maps and tables.

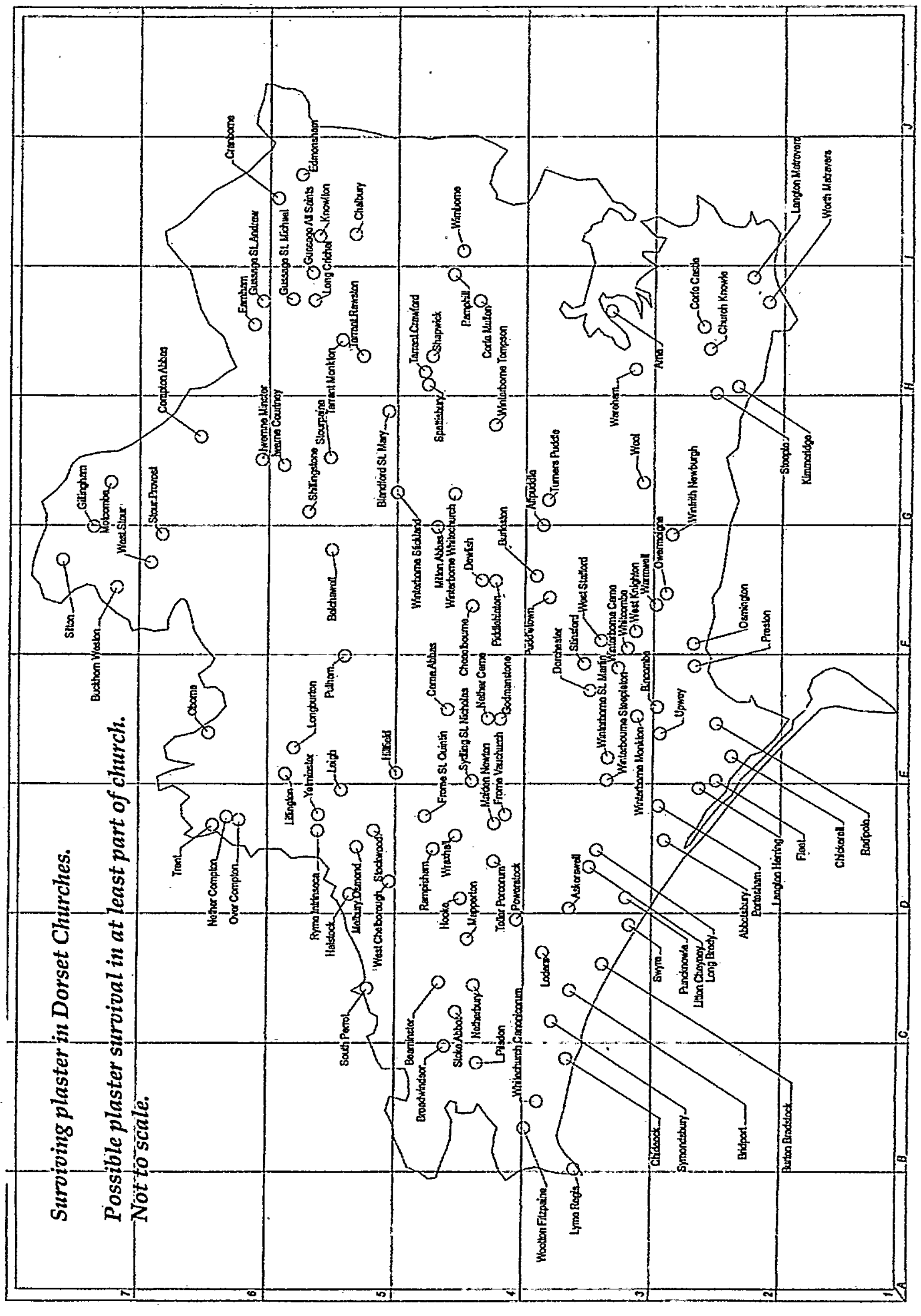
Included in this chapter are all the maps and tables used in support of the survey data presented in the rest of the dissertation.

The same data is also available on the attached CD version in chapter 15. The definition of the images on the CD is substantially better than that reproduced here.

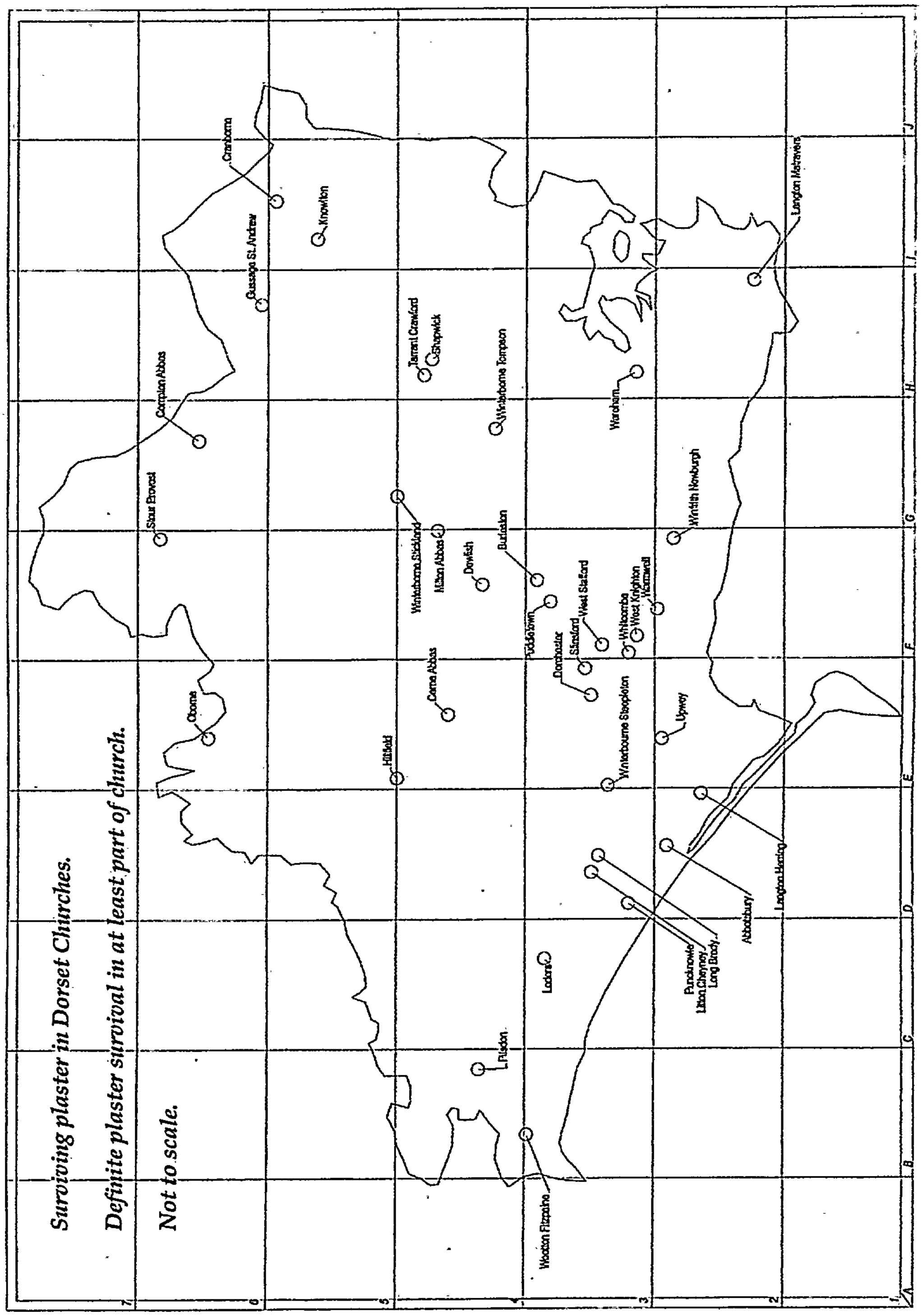
Index to maps and tables :



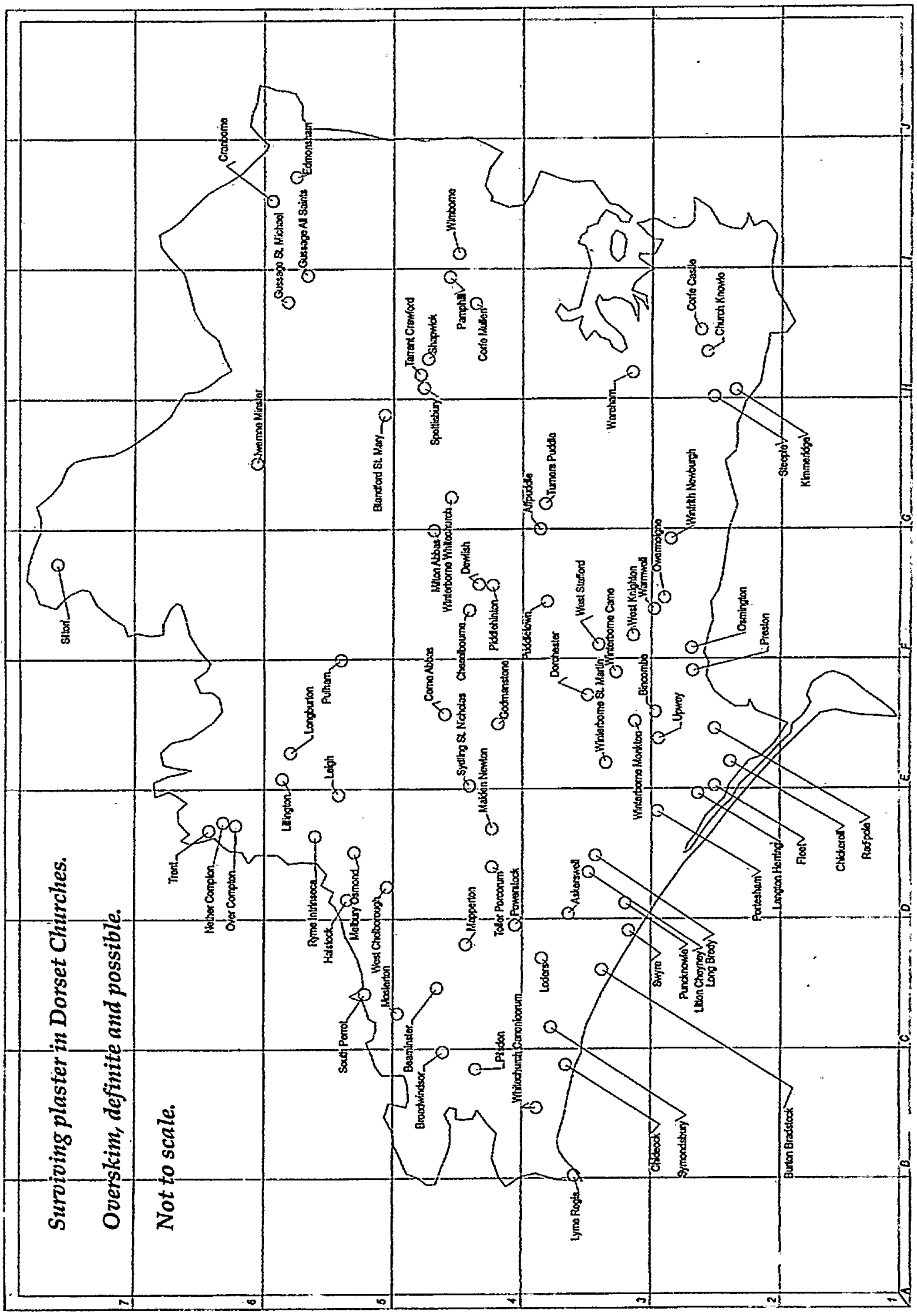
12.1: Base map showing all churches included in the survey.



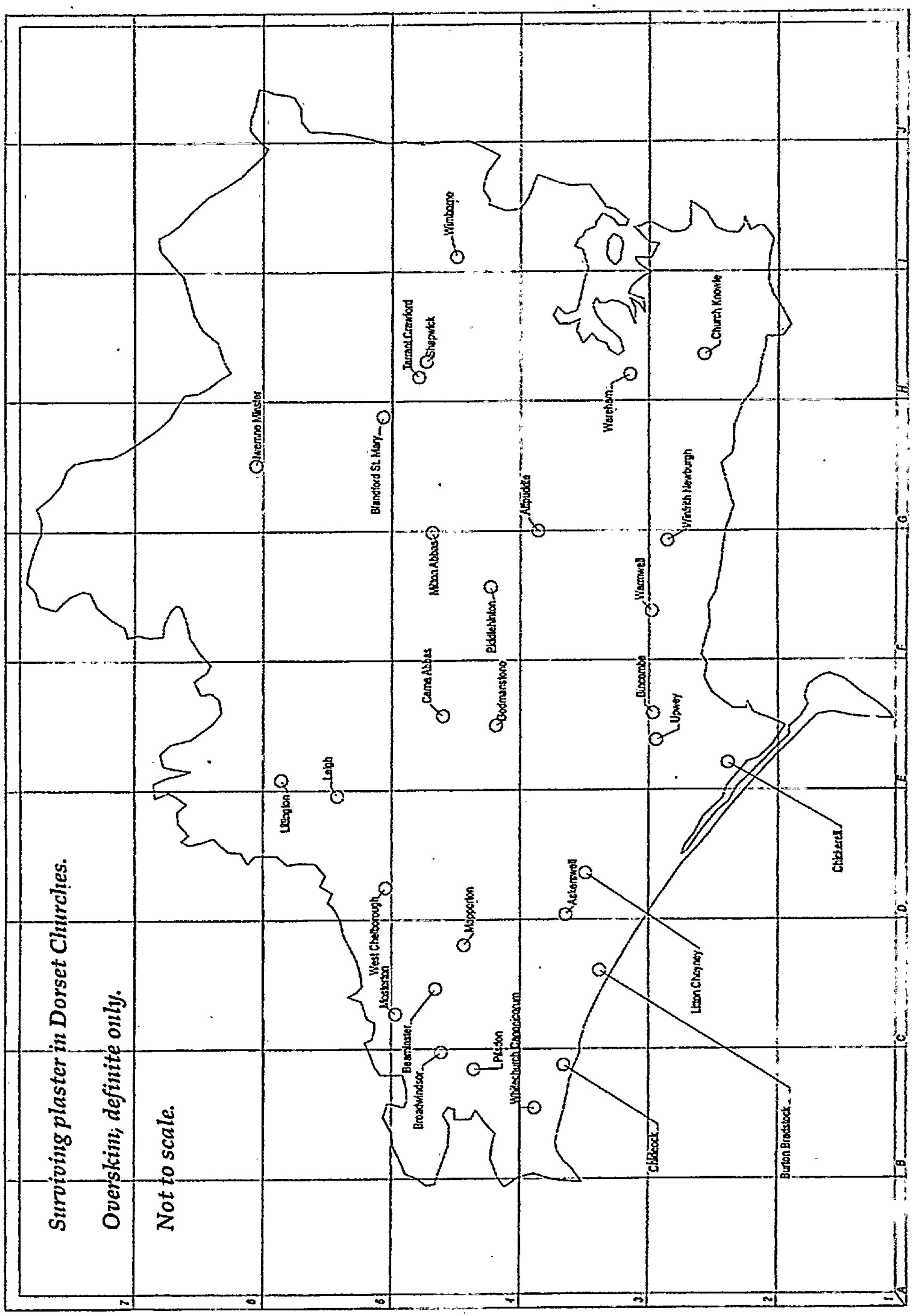
12.2 : Definite and possible plaster survival in at least part of the church



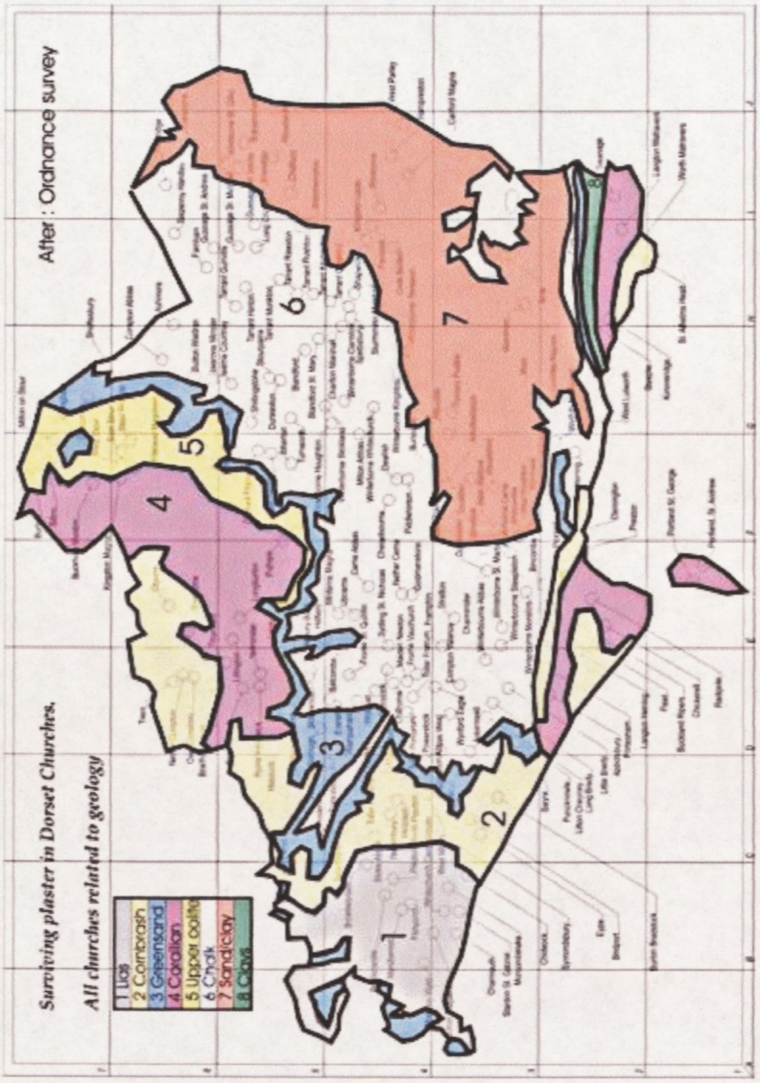
12.3 : Definite plaster survival in at least part of the church.



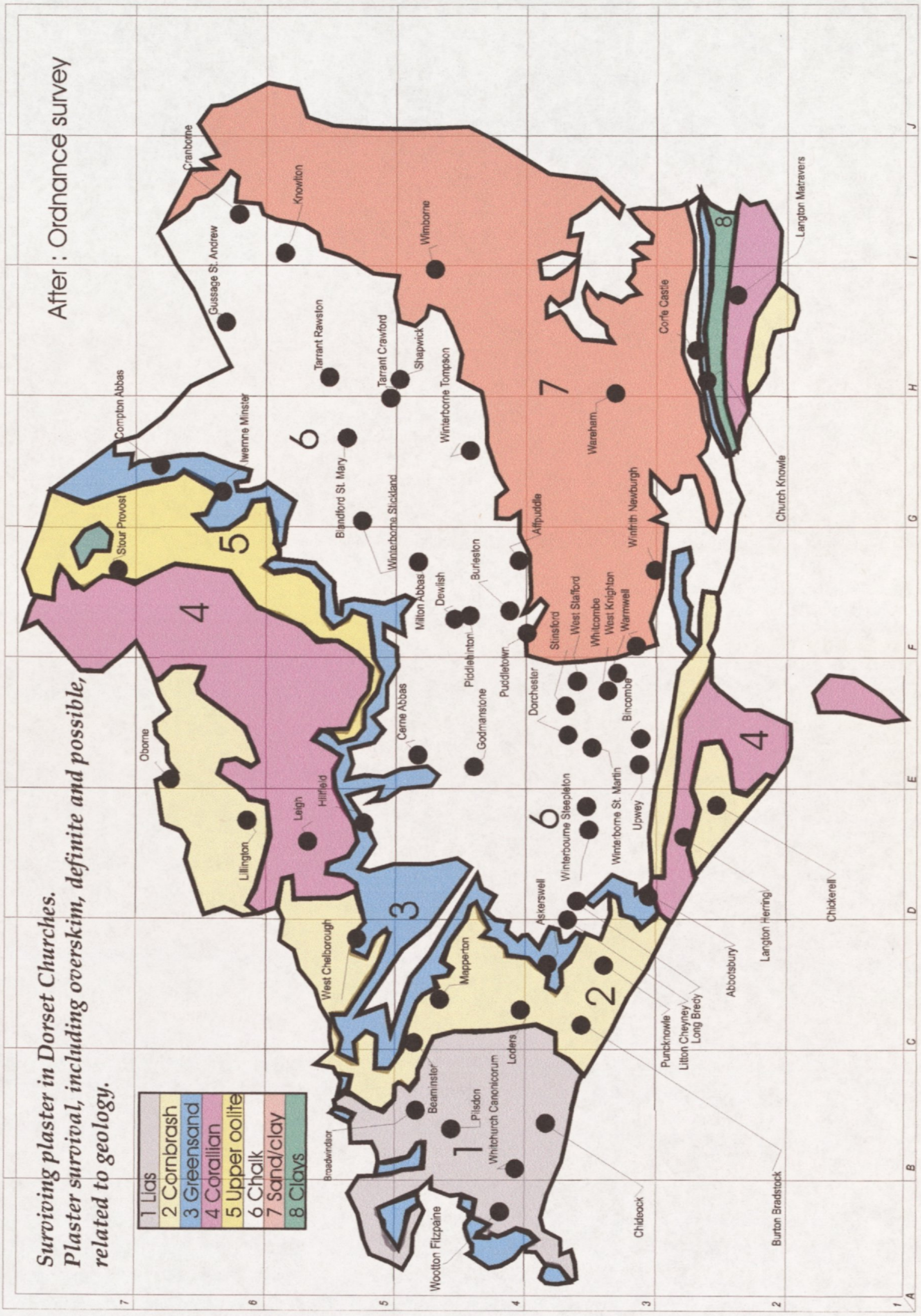
12.4 : Definite and possible overskim in at least part of the church.



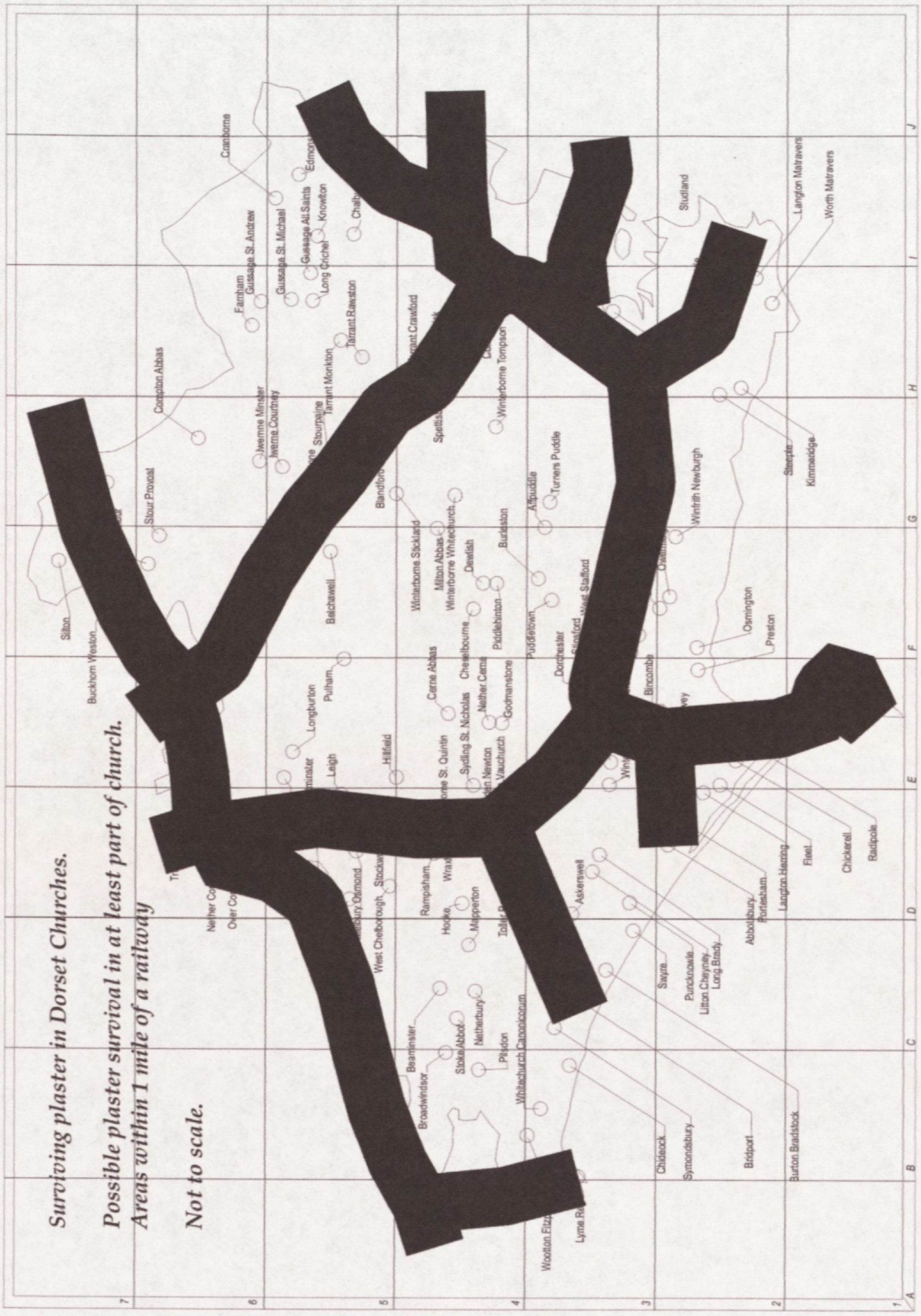
12.5 : Definite overskim in at least part of the church.



12.6 : Geology related to all the churches included in the survey.

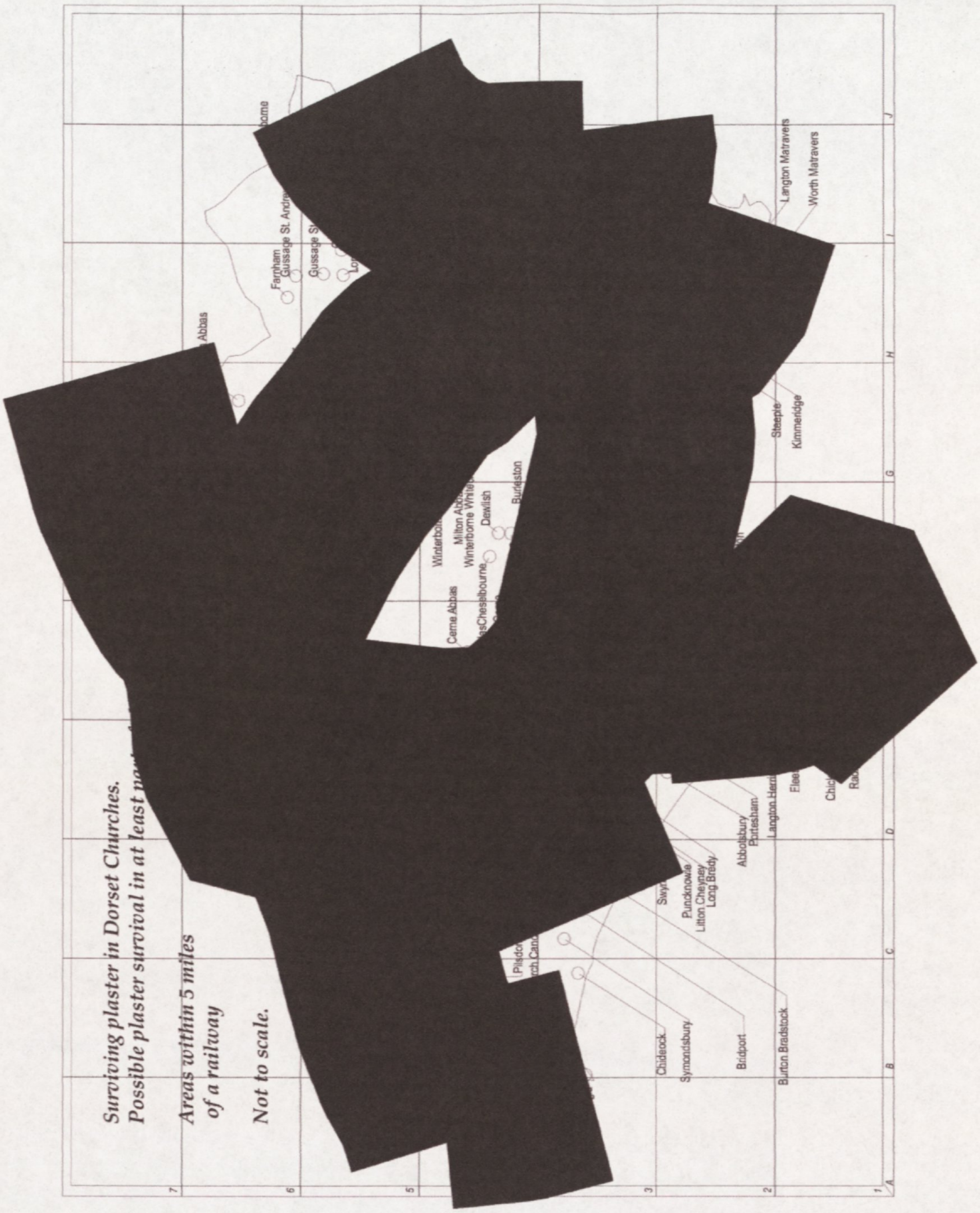


12.7 : Geology related to churches with definite and possible plaster survival.



12.8 : Churches with surviving plaster within one mile of a railway line.

12.9 : Churches with surviving plaster within two miles of a railway line.



12.10 : Churches with surviving plaster within five miles of a railway.

All churches by architect

Source : Pevsner supplemented by RCHM. Where sources differ, Pevsner is given precedence, except where this interpretation is contradicted by physical survey. See note in literature review.

Key : x = no evidence : n = no old plaster : ps = possible old plaster : y = definite old plaster

Church	Plaster survival			Architect
	nave	chan(	other	
Verwood, St Michael	x	x	x	Adye and Adye
East Stour, Christ Church	n	n	n	Alexander
Enmore Green, St John Evangelist	x	x	x	Alexander
Motcombe, St Mary	n	n	ps	Alexander
Sutton Waldron, St Bartholomew	n	n	n	Alexander
More Crichel, St Mary	x	x	x	Alexander
Broadwindsor, St John Baptist	ps	ps	ps	Allen
Corscombe, St Mary	n	n	n	Allen
Drimpton, St Mary	x	x	x	Allen
Thorncombe, St Mary	x	x	x	Allen
Stoke Abbott, St Mary	ps	ps	n	Aubyn
Charlton Marshall, St Mary	x	x	x	Bastards
Almer, St Mary	x	x	x	Bastards
Blandford Forum, St Peter and St Paul	n	n	n	Bastards, Hunt
Warmwell, Holy Trinity	y	n	x	Bennett
Wootton Fitzpaine, [? Dedication]	ps	ps	y	Birch
Melbury Osmond, St Osmond	ps	n	n	Blomfield
Poole, (Longfleet), St Mary	x	x	x	Blore
Woodlands, Ascension	n	n	n	Bodley
Poole, (Branksome), St Aldhelm	x	x	x	Bodley and Garner
Wimborne St Giles, St Giles	n	n	n	Bodley, Comper
Creech Grange, St John Evangelist	x	x	x	Bond
Stalbridge, St Mary	x	x	x	Boucher, T.H. Wyatt
Blackdown, Holy Trinity	x	x	x	Bracebridge
Canford Magna, [? Dedication]	n	n	n	Brandon
Cranborne, St Mary And St Bartholomew.	y	ps	y	Brandon
Bradford Peverell, St Mary	x	x	x	Burton
Poole, (Branksome Park), All Saints	x	x	x	Burton and Stevens
Askerswell, St Michael	ps	ps	ps	Bury
Bridport, St Andrew	x	x	x	Bury
Broadoak, St Paul	x	x	x	Bury
Weymouth, St John	x	x	x	Bury
Eype, St Peter	n	n	n	Bury (Boulton carver)
Weymouth, Holy Trinity	x	x	x	Bury, Crickmay and Son
Colehill, St Michael	x	x	x	Caroe
Haydon, St Catherine	x	x	x	Carpenter
Monkton Wyld, St Andrew	n	n	n	Carpenter
North Wooton, St Mary Magdalene	x	x	x	Carpenter and Ingelow
Beaminster, Holy Trinity	x	x	x	Carver and Giles
Chedington, St James	x	x	x	Carver, Vialls
Horton, St Wolfreda	x	x	x	Chapman
Forde Abbey	x	x	x	Chard
Gussage All Saints, All Saints	ps	ps	ps	Christian
Piddlehinton, St Mary	ps	n	ps	Christian
Winterborne Monkton, St Michael (RCHM S	ps	ps	ps	Christian
Alton Pancras, St Pancras	x	x	x	Christian, Crickmay

12.11 : All churches sorted by known architect.

Bourton, St George	n	n	n	Christian, Ponting
Chaldon Herring, St Nicholas	n	n	n	Crickmay
Chideock, St Giles	ps	n	ps	Crickmay
Glanvilles Wooton, St Mary	x	x	x	Crickmay
Hinton Martell, St John Evangelist	x	x	x	Crickmay
Holwell, St Lawrence	x	x	x	Crickmay
Hooke, St Giles	ps	ps	ps	Crickmay
Langton Matravers, St George	n	n	y	Crickmay
Margaret Marsh, St Margaret	x	x	x	Crickmay
Portland, Southwell, St Andrew	x	x	x	Crickmay
Salway Ash, Holy Trinity	x	x	x	Crickmay
Sixpenny Handley, St Mary	n	n	n	Crickmay
Stoke Wake, All Saints	x	x	x	Crickmay
Turnworth, St Mary	n	n	n	Crickmay
Seaborough, St John	x	x	x	Crickmay
Buckhorn Weston, St John Baptist	ps	ps	ps	Crickmay
West Milton, St Mary Magdalene	n	n	n	Crickmay ('worked with' Hansford)
Lytchett Heath, St Aldhelm	x	x	x	Crickmay and Son
Stratton, St Mary	n	n	n	Crickmay and son
Broadwey, St Nicholas	x	x	x	Crickmay and son
Beer Hackett, St Michael	n	n	n	Crickmay, Ponting
Wareham, St Mary	n	ps	y	Donaldson
Portland, Grove, St Peter	x	x	x	Du Cane
Ashmore, St Nicholas	n	n	n	Edwards
Bloxworth, St Andrew	x	x	x	Evans
Compton Abbas, St Mary	n	n	n	Evans
Fontmell Magna, St Andrew	x	x	x	Evans
Melbury Abbas, St Thomas	x	x	x	Evans
Poxwell, St John Evangelist (pulled down)	x	x	x	Evans
Poxwell, StJohn the Baptist	x	x	x	Evans
Sturminster Newton, St Mary	x	x	x	Evans
East Orchard, St Thomas	x	x	x	Evans and Pullman, Christian
Longburton, St James	ps	ps	ps	Farrall
Folke, St Lawrence	x	x	x	Farrall
Weymouth, St Paul	x	x	x	Fellowes Prynne
Compton Valence, St Thomas of Canterbury	n	n	n	Ferrey
Dorchester, All Saints	x	x	x	Ferrey
Dorchester, Holy Trinity	x	x	x	Ferrey
Frampton, St Mary	n	n	n	Ferrey
Little Bredy, St Michael	n	n	n	Ferrey
Melplash, Christ Church	n	n	n	Ferrey
Osmington, St Osmund	ps	ps	ps	Ferrey
Plush, St John Baptist	x	x	x	Ferrey
Tarrant Hinton, St Mary	n	n	n	Ferrey
Tincleton, St John Evangelist	n	n	n	Ferrey
Tyneham, St Mary	x	x	x	Ferrey
Winterborne Whitechurch, St Mary	n	ps	ps	Ferrey
Leweston, Holy Trinity	x	x	x	Fitzjames
Broadstone, St John Baptist	x	x	x	Fletcher
Stock Gaylard, St Barnabas	x	x	x	Fletcher
Wimborne, Leigh, St John Evangelist	x	x	x	Fletcher
Moreton, St Nicholas	x	x	x	Frampton
Iwerne Courtney (Shroton), St Mary	ps	ps	ps	Freke
Portland, Easton, St George	n	n	n	Gilbert
Over Compton, St Michael	ps	n	ps	Goodden
Pimperne, St Peter	x	x	x	Green

12.11 : All churches sorted by known architect, continued

Weymouth, St Mary	x	x	x	Hamilton
Durweston, St Nicholas	n	n	n	Hardwick
Athelhampton, St John	n	n	n	Hicks
Batcombe, St Mary	n	n	n	Hicks
Bettiscombe, St Stephen	n	n	n	Hicks
Bridport, St Mary	x	n	n	Hicks
Broadmayne, St Martin	x	x	x	Hicks
Compton Abbas West, [? Dedication]	n	n	n	Hicks
Coombe Keynes, Holy Rood	n	n	n	Hicks
Dorchester, St Peter	n	n	n	Hicks
East Holme, St John Evangelist	x	x	x	Hicks
East Lulworth, St Andrew	x	x	x	Hicks
North Poorton, St Mary Magdalene	n	n	n	Hicks
Okeford Fitzpaine, St Andrew	n	n	n	Hicks
Powerstock, St Mary	ps	n	ps	Hicks
Shipton Gorge, St Martin	x	x	x	Hicks
Stour Row, All Saints	x	x	x	Hicks
Wool, Holy Rood	ps	n	ps	Hicks
West Knighton, St Peter	y	ps	y	Hicks (Hardy)
West Lulworth, Holy Trinity	n	n	n	Hicks (supervised by Crickmay)
Piddletrenthide, All Saints	x	x	x	Hicks, Christian
Swanage (Herston), St Mark	x	x	x	Hicks, Crickmay
Pulham, St Thomas Becket	ps	ps	ps	Hingeston-Randolph
Puncknowle, St Mary	y	y	y	Houghton-Spencer
Shillingstone, Holy Rood	ps	n	n	Hunt, Bodley
Owermoigne, St Michael	ps	ps	ps	Jackson
Milton Abbas, St James	n	n	n	James Wyatt, Fletcher
Poole, St James	x	x	x	Kent and Hannaford
Winterborne Clenston, St Nicholas	n	n	n	Louis Vulliamy
Portland, Easton, St Andrew, (ruin)	n	n	n	Merrick
Portland, Fortuneswell, St John Baptist	x	x	x	Monday (Wallace), Crickmay
Hamworthy, St Michael	n	n	n	Morley and Bolden
Chettle, St Mary	x	x	x	Morris and Henson
Hinton St Mary, St Peter	x	x	x	Oborne
Wynford Eagle, St Lawrence	n	n	n	Osborn
East Stoke, St Mary	x	x	x	Owen, Colson and Son
East Burton, [? dedication]	x	x	x	Parkinson
Mosterton, St Mary	ps	n	ps	Pearce
Catherston Leweston, St Mary	x	x	x	Pearson
Burstock, St Andrew	x	x	x	Peters
Blandford St Mary, St Mary	n	ps	n	Pitt
Dorchester, St Mary	x	x	x	Ponting
Ibberton, St Eustace	n	n	n	Ponting
Kingston Lacy, St Stephen	n	n	n	Ponting
Puddletown, St Mary	y	ps	ps	Ponting
West Stafford, St Andrew	y	ps	ps	Ponting
Weymouth, St Martin	x	x	x	Ponting
Bradpole, Holy Trinity	x	x	x	Ponting
Gillingham, St Mary	n	ps	n	Ponting and Caroe
Winterborne Tomson, St Andrew	y	y	y	Powys
Alderholt, St James	x	x	x	Prior
Bothenhampton, Holy Trinity	n	n	n	Prior
Burton Bradstock, St Mary	ps	ps	ps	Prior
Halstock, St Mary	ps	n	n	Pugin
Rampisham, St Michael	ps	ps	ps	Pugin, Hicks
Kingston, Old Church	x	x	x	Repton

12.11 : All churches sorted by known architect, continued

Dorchester, Fordington, St George	x	x	y	Rev. Moule and Feacey
Trent, St Andrew	n	ps	n	Rev. William Henry Turner
Shapwick, St Bartholomew	ps	ps	y	Rogers
Hampreston, All Saints	n	n	n	Romaine-Walker and Tanner
Poole, (Branksome), St Clement	x	x	x	Romaine-Walker and Tanner
Woolland, [? Dedication]	x	x	x	Scott
Shaftesbury, Holy Trinity	x	x	x	Scott, Doran Webb
Cattistock, St Peter and St Paul	n	n	n	Scott, Scott jnr
Morden, St Mary	x	x	x	Seller
Caundle Marsh, St Peter and St Paul	x	x	x	Shout
Evershot, St Osmund	n	n	n	Shout, Shout
Bishops Caundle, St Peter and St Paul	x	x	x	Slater
Oborne, St Cuthbert	x	x	x	Slater
Sherborne, St Mary Magdalene	x	x	x	Slater
Pentridge, St Rumbold	n	n	n	Slater
Chetnole, St Peter	n	n	n	Slater and Carpenter
Mappowder, St Peter and St Paul	x	x	x	Slater and Carpenter
Milton on Stour, St Simon and St Jude	n	n	n	Slater and Carpenter
Sherborne, Abbey	n	n	n	Slater and Carpenter
Thornford, St Mary Magdalene	n	n	n	Slater and Carpenter
South Perrott, St Mary	ps	ps	ps	Southcombe Parker
West Moors, St Mary	x	x	x	Stanley
Gussage St Michael, St Michael	ps	ps	ps	Street
Kingston, St James	x	x	x	Street
Milborne St Andrew, St Andrew	x	x	x	Street
Winterborne Kingston, St Nicholas	n	n	n	Street
Bere Regis, St John Baptist	x	x	x	Street
Fleet, Holy Trinity	n	n	n	Strickland
Affpuddle, St Laurence	ps	ps	n	T.H. Wyatt
Buckland Newton, Holy Rood	x	x	x	T.H. Wyatt
Cerne Abbas, St Mary	y	ps	ps	T.H. Wyatt
Child Okeford, St Nicholas	n	n	n	T.H. Wyatt
Corfe Castle, St Edward	ps	n	n	T.H. Wyatt
Dewlish, All Saints	y	n	y	T.H. Wyatt
Iwerne Minster, St Mary	ps	n	ps	T.H. Wyatt, Pearson
Langton Long (Blandford), All Saints	x	x	x	T.H. Wyatt
Morcombelake, St Gabriel	n	n	n	T.H. Wyatt and Brandon
Preston, St Andrew	ps	ps	ps	T.H. Wyatt
Shaftesbury, St James	x	x	x	T.H. Wyatt
Spetisbury, St John Baptist	n	n	ps	T.H. Wyatt
Stourpaine, Holy Trinity	n	n	ps	T.H. Wyatt
Swanage, All Saints	n	n	n	T.H. Wyatt
Tarrant Gunville, St Mary	n	n	n	T.H. Wyatt
Tarrant Keyneston, All Saints	n	n	n	T.H. Wyatt
Tolpuddle, St John Evangelist	n	n	n	T.H. Wyatt
West Orchard, [? Dedication]	x	x	x	T.H. Wyatt
Wimborne Minster, St Cuthburga	ps	ps	ps	T.H. Wyatt, Pearson
Winterborne Houghton, St Andrew	n	n	n	T.H. Wyatt
Winterborne Zelston, St Mary	x	x	x	T.H. Wyatt
Woodsford, St John Evangelist	n	n	n	T.H. Wyatt
Toller Porcorum, St Peter and St Andrew	n	ps	n	Taylor and Gordon
Lytchett Minster, [? Dedication]	x	x	x	Tulloch
Poole, (Parkstone), St Peter	x	x	x	Tulloch, Rogers, Pearson
Holt, St James	x	x	x	Tulloch, T.H. Wyatt
Kingston Magna, All Saints	n	n	n	Turner
Marshwood, St Mary	n	n	n	Vialls

12.11 : All churches sorted by known architect, continued

Shaftesbury (Cann), St Rumbold	x	x	x	Walker
Bridport, St Swithun	x	x	x	Wallis
Charmouth, St Andrew	n	n	n	Wallis (Poss Fowler)
Toller Whelme, St John	n	n	n	Warr
Beaminster, St Mary	ps	ps	ps	White
Leigh, St Andrew	ps	ps	n	Withers
Lillington, St Martin	ps	ps	ps	Withers
Melbury Bubb, St Mary	n	n	n	Withers (Builder Shout)
Hilfield, St Nicholas	y	n	x	Withers (poss roof only)
Sturminster Marshall, St Mary	n	n	n	Woodyer
Milton Abbas, Abbey	y	n	n	Wyatt, Middleton, Scott
Abbotsbury, Abbey	n	n	n	x
Abbotsbury, St Catherine's Chapel.	n	n	n	x
Abbotsbury, St Nicholas	y	y	y	x
Anderson, St Michael	x	x	x	x
Arne, St Nicholas	ps	ps	x	x
Balndford Forum, St Leonard's Chapel	x	x	x	x
Belchalwell, St Aldhelm	ps	n	n	x
Bincombe, Holy Trinity	ps	ps	x	x
Bindon Abbey, ruin	x	x	x	x
Bothenhampton, Old Church	ps	ps	x	x
Boveridge, St Aldhelm	x	x	x	x
Bradford Abbas, St Mary	n	n	n	x
Brownsea Island, St Mary	n	n	n	x
Buckland Ripers, St Nicholas	n	n	n	x
Burleston, [? Dedication] ruin	n	y	ps	x
Chalbury, All Saints	ps	ps	n	x
Charborough, St Mary	x	x	x	x
Charminster, St Mary	y	ps	x	x
Cheselbourne, St Martin	ps	ps	ps	x
Chickerell, St Mary	ps	ps	n	x
Chilcombe, [? Dedication]	x	x	x	x
Chilfrome, Holy Trinity	n	n	n	x
Church Knowle, St Peter	ps	ps	ps	x
Compton Abbas, Old Church (ruin)	n	n	y	x
Corfe Mullen, St Hubert	ps	ps	ps	x
Edmondsham, St Nicholas	ps	ps	ps	x
Farnham, St Laurence	ps	n	n	x
Farrington, St Peter	x	x	x	x
Fifehead Magdalen, St Mary Magdalene	n	n	n	x
Fifehead Neville, All Saints	x	x	x	x
Fishpond, St John Baptist	n	n	n	x
Fleet, Old Church	n	ps	n	x
Frome St Quintin, St Quintin	n	ps	n	x
Frome Vauchurch, [? Dedication]	ps	ps	n	x
Goathill, St Peter	x	x	x	x
Godmanstone, Holy Trinity	ps	ps	ps	x
Gussage St Andrew, St Andrew	y	ps	ps	x
Hammoon, St Paul	x	x	x	x
Hanford, St Michael and all Angels	x	x	x	x
Hazelbury Bryan, St Mary and St James	x	x	x	x
Hermitage, St Mary	x	x	x	x
Hilton, All Saints	x	x	x	x
Hinton Parva, St Kenelm	x	x	x	x
Holnest, St Mary	x	x	x	x
Iwerne Stepleton, St Mary	x	x	x	x

12.11 : All churches sorted by known architect, continued

Kimmeridge, [? Dedication]	ps	ps	x	x
Knowlton (inside circles), ruin	y	y	y	x
Langton Herring, St Peter	y	ps	y	x
Lewcombe, St James	x	x	x	x
Litton Cheyney, St Mary	ps	ps	y	x
Loders, St Mary Magdalene	y	ps	ps	x
Long Bredy, St Peter	n	ps	ps	x
Long Crichel, St Mary	n	n	ps	x
Lydlinch, St Thomas Becket	x	x	x	x
Lyme Regis, St Michael	ps	ps	n	x
Lyscombe, ruin	x	x	x	x
Lytchett Matravers, St Mary	x	x	x	x
Maiden Newton, St Mary	ps	ps	ps	x
Manston, St Nicholas	x	x	x	x
Mapperton, All Saints	ps	ps	ps	x
Marnhull, St Gregory	x	x	x	x
Melbury Sampford, St Mary	x	x	x	x
Melcombe Horsey, St Andrew	x	x	x	x
Milton Abbas, St catherine's chapel	x	x	x	x
Minterne Magna, St Andrew	n	n	n	x
Nether Cerne, All Saints	ps	ps	ps	x
Nether Compton, St Nicholas	ps	ps	ps	x
Netherbury, St Mary	ps	ps	x	x
North Wooton, Old Church (ruin)	x	x	x	x
Oborne, Old Church	y	y	x	x
Pamphill, St Margaret and St Andrew	ps	ps	ps	x
Pilsdon, St Mary	y	y	x	x
Portesham, (Corton), St Bartholomew	x	x	x	x
Portesham, St Peter	ps	ps	n	x
Poyntington, All Saints	x	x	x	x
Purse Caundle, St Peter	x	x	x	x
Radipole, St Ann	ps	ps	ps	x
Ryme Intrinseca, St Hippolyte	ps	ps	x	x
Sandford Orcas, St Nicholas	x	x	x	x
Shaftesbury, St Peter	n	n	n	x
Silton, St Nicholas	ps	ps	ps	x
St Aldhelm's Head, St Aldhelm's Chapel	n	n	n	x
Stanton St Gabriel, Old Church, ruin	n	n	n	x
Steeple, St Michael	ps	ps	ps	x
Stinsford, St Michael	y	ps	ps	x
Stockwood, St Edwold	ps	x	x	x
Stour Provost, St Michael	ps	y	n	x
Stourton Caundle, St Peter	x	x	x	x
Studland, St Nicholas	y	ps	ps	x
Swyre, Holy Trinity	ps	ps	x	x
Sydling St Nicholas, St Nicholas	ps	ps	x	x
Symondsbury, St John Baptist	ps	ps	ps	x
Tarrant Crawford, St Mary	y	y	y	x
Tarrant Monkton, All Saints	ps	ps	x	x
Tarrant Rawston, St Mary	ps	ps	ps	x
Tarrant Rushton, St Mary	n	n	n	x
Todber, [? Dedication]	x	x	x	x
Toller Fratum, St Basil	n	n	n	x
Turners Puddle, Holy Trinity	ps	ps	ps	x
Upcerne, [? Dedication]	x	x	x	x
Upwey, St Laurence	y	n	y	x

12.11 : All churches sorted by known architect, continued

Walditch, St Mary	x	x	x	x
Wareham, Holy Trinity	n	n	n	x
Wareham, St Martin	y	y	y	x
West Chelborough, St Andrew	ps	ps	ps	x
West Milton, Old Church	n	n	n	x
West Moors, St John	x	x	x	x
West Parley, All Saints	n	n	n	x
West Stour, St Mary	ps	ps	n	x
Whitchurch Canonicorum, St Candida St Wi	ps	ps	ps	x
Whitcombe, [? Dedication]	y	y	y	x
Winfrith Newburgh, St Christopher	y	y	y	x
Winterborne Came, St Peter	ps	ps	x	x
Winterborne St Martin, St Martin	y	y	ps	x
Winterborne Stickland, St Mary	y	y	y	x
Winterbourne Abbas, St Mary	n	n	ps	x
Winterbourne Steepleton, St Michael	y	ps	ps	x
Witchampton, St Mary and St Cuthberga	n	n	n	x
Worth Matravers, St Nicholas	ps	ps	ps	x
Wraxall, St Mary	ps	ps	ps	x
Wyke Regis, All Saints	x	x	x	x
Yetminster, St Andrew	n	ps	n	x

12.11 : All churches sorted by known architect, continued

Old plaster (certain & possible) by architect

Source : Pevsner supplemented by RCHM. Where sources differ, Pevsner is given precedence, except where this interpretation is contradicted by physical survey. See note in literature review.

Key : x = no evidence : n = no old plaster : ps = possible old plaster : y = definite old plaster

Church	Plaster survival			Architect
	nave	chancel	other	
Motcombe, St Mary	n	n	ps	Alexander
Broadwindsor, St John Baptist	ps	ps	ps	Allen
Stoke Abbott, St Mary	ps	ps	n	Aubyn
Warmwell, Holy Trinity	y	n	x	Bennett
Wootton Fitzpaine, [? Dedication]	ps	ps	y	Birch
Melbury Osmond, St Osmond	ps	n	n	Blomfield
Cranborne, St Mary And St Bartholomew.	y	ps	y	Brandon
Askerswell, St Michael	ps	ps	ps	Bury
Gussage All Saints, All Saints	ps	ps	ps	Christian
Piddlehinton, St Mary	ps	n	ps	Christian
Winterborne Monkton, St Michael (RCHM S	ps	ps	ps	Christian
Chideock, St Giles	ps	n	ps	Crickmay
Hooke, St Giles	ps	ps	ps	Crickmay
Langton Matravers, St George	n	n	y	Crickmay
Buckhorn Weston, St John Baptist	ps	ps	ps	Crickmay
Wareham, St Mary	n	ps	y	Donaldson
Longburton, St James	ps	ps	ps	Farrall
Osmington, St Osmund	ps	ps	ps	Ferrey
Winterborne Whitechurch, St Mary	n	ps	ps	Ferrey
Iwerne Courtney (Shroton), St Mary	ps	ps	ps	Freke
Over Compton, St Michael	ps	n	ps	Goodden
Powerstock, St Mary	ps	n	ps	Hicks
Wool, Holy Rood	ps	n	ps	Hicks
West Knighton, St Peter	y	ps	y	Hicks (Hardy)
Pulham, St Thomas Becket	ps	ps	ps	Hingeston-Randolph
Puncknowle, St Mary	y	y	y	Houghton-Spencer
Shillingstone, Holy Rood	ps	n	n	Hunt, Bodley
Owermoigne, St Michael	ps	ps	ps	Jackson
Mosterton, St Mary	ps	n	ps	Pearce
Blandford St Mary, St Mary	n	ps	n	Pitt
Puddletown, St Mary	y	ps	ps	Ponting
West Stafford, St Andrew	y	ps	ps	Ponting
Gillingham, St Mary	n	ps	n	Ponting and Caroe
Winterborne Tomson, St Andrew	y	y	y	Powys
Burton Bradstock, St Mary	ps	ps	ps	Prior
Halstock, St Mary	ps	n	n	Pugin
Rampisham, St Michael	ps	ps	ps	Pugin, Hicks
Dorchester, Fordington, St George	x	x	y	Rev. Moule and Feacey
Trent, St Andrew	n	ps	n	Rev. William Henry Turner
Shapwick, St Bartholomew	ps	ps	y	Rogers
South Perrott, St Mary	ps	ps	ps	Southcombe Parker
Gussage St Michael, St Michael	ps	ps	ps	Street
Affpuddle, St Laurence	ps	ps	n	T.H. Wyatt
Cerne Abbas, St Mary	y	ps	ps	T.H. Wyatt

12.12 : Old plaster survival (certain and possible) by architect.

Corfe Castle, St Edward	ps	n	n	T.H. Wyatt
Dewlish, All Saints	y	n	y	T.H. Wyatt
Iwerne Minster, St Mary	ps	n	ps	T.H. Wyatt, Pearson
Preston, St Andrew	ps	ps	ps	T.H. Wyatt
Spetisbury, St John Baptist	n	n	ps	T.H. Wyatt
Stourpaine, Holy Trinity	n	n	ps	T.H. Wyatt
Wimborne Minster, St Cuthburga	ps	ps	ps	T.H. Wyatt, Pearson
Toller Porcorum, St Peter and St Andrew	n	ps	n	Taylor and Gordon
Beaminster, St Mary	ps	ps	ps	White
Leigh, St Andrew	ps	ps	n	Withers
Lillington, St Martin	ps	ps	ps	Withers
Hilfield, St Nicholas	y	n	x	Withers (poss roof only)
Milton Abbas, Abbey	y	n	n	Wyatt, Middleton, Scott
Abbotsbury, St Nicholas	y	y	y	x
Arne, St Nicholas	ps	ps	x	x
Belchalwell, St Aldhelm	ps	n	n	x
Bincombe, Holy Trinity	ps	ps	x	x
Bothenhampton, Old Church	ps	ps	x	x
Burleston, [? Dedication] ruin	n	y	ps	x
Chalbury, All Saints	ps	ps	n	x
Charminster, St Mary	y	ps	x	x
Cheselbourne, St Martin	ps	ps	ps	x
Chickerell, St Mary	ps	ps	n	x
Church Knowle, St Peter	ps	ps	ps	x
Compton Abbas, Old Church (ruin)	n	n	y	x
Corfe Mullen, St Hubert	ps	ps	ps	x
Edmondsham, St Nicholas	ps	ps	ps	x
Farnham, St Laurence	ps	n	n	x
Fleet, Old Church	n	ps	n	x
Frome St Quintin, St Quintin	n	ps	n	x
Frome Vauchurch, [? Dedication]	ps	ps	n	x
Godmanstone, Holy Trinity	ps	ps	ps	x
Gussage St Andrew, St Andrew	y	ps	ps	x
Kimmeridge, [? Dedication]	ps	ps	x	x
Knowlton (inside circles), ruin	y	y	y	x
Langton Herring, St Peter	y	ps	y	x
Litton Cheyney, St Mary	ps	ps	y	x
Loders, St Mary Magdalene	y	ps	ps	x
Long Bredy, St Peter	n	ps	ps	x
Long Crichel, St Mary	n	n	ps	x
Lyme Regis, St Michael	ps	ps	n	x
Maiden Newton, St Mary	ps	ps	ps	x
Mapperton, All Saints	ps	ps	ps	x
Nether Cerne, All Saints	ps	ps	ps	x
Nether Compton, St Nicholas	ps	ps	ps	x
Netherbury, St Mary	ps	ps	x	x
Oborne, Old Church	y	y	x	x
Pamphill, St Margaret and St Andrew	ps	ps	ps	x
Pilsdon, St Mary	y	y	x	x
Portesham, St Peter	ps	ps	n	x
Radipole, St Ann	ps	ps	ps	x
Ryme Intrinseca, St Hippolyte	ps	ps	x	x
Silton, St Nicholas	ps	ps	ps	x
Steeple, St Michael	ps	ps	ps	x
Stinsford, St Michael	y	ps	ps	x
Stockwood, St Edwold	ps	x	x	x

12.12 : Old plaster survival (certain and possible) by architect, continued.

Stour Provost, St Michael	ps	y	n	x
Studland, St Nicholas	y	ps	ps	x
Swyre, Holy Trinity	ps	ps	x	x
Sydling St Nicholas, St Nicholas	ps	ps	x	x
Symondsbury, St John Baptist	ps	ps	ps	x
Tarrant Crawford, St Mary	y	y	y	x
Tarrant Monkton, All Saints	ps	ps	x	x
Tarrant Rawston, St Mary	ps	ps	ps	x
Turners Puddle, Holy Trinity	ps	ps	ps	x
Upwey, St Laurence	y	n	y	x
Wareham, St Martin	y	y	y	x
West Chelborough, St Andrew	ps	ps	ps	x
West Stour, St Mary	ps	ps	n	x
Whitchurch Canonicorum, St Candida St Wi	ps	ps	ps	x
Whitcombe, [? Dedication]	y	y	y	x
Winfrith Newburgh, St Christopher	y	y	y	x
Winterborne Came, St Peter	ps	ps	x	x
Winterborne St Martin, St Martin	y	y	ps	x
Winterborne Stickland, St Mary	y	y	y	x
Winterbourne Abbas, St Mary	n	n	ps	x
Winterbourne Steepleton, St Michael	y	ps	ps	x
Worth Matravers, St Nicholas	ps	ps	ps	x
Wraxall, St Mary	ps	ps	ps	x
Yetminster, St Andrew	n	ps	n	x

12.12 : Old plaster survival (certain and possible) by architect, continued..

Old plaster (certain) by architect

Source : Pevsner supplemented by RCHM. Where sources differ, Pevsner is given precedence, except where this interpretation is contradicted by physical survey. See note in literature review.

Key : x = no evidence : n = no old plaster : ps = possible old plaster : y = definite old plaster

Church	Plaster survival			Architect
	nave	chancel	other	
Warmwell, Holy Trinity	y	n	x	Bennett
Wootton Fitzpaine, [? Dedication]	ps	ps	y	Birch
Cranborne, St Mary And St Bartholomew.	y	ps	y	Brandon
Langton Matravers, St George	n	n	y	Crickmay
Wareham, St Mary	n	ps	y	Donaldson
West Knighton, St Peter	y	ps	y	Hicks (Hardy)
Puncknowle, St Mary	y	y	y	Houghton-Spencer
Puddletown, St Mary	y	ps	ps	Ponting
West Stafford, St Andrew	y	ps	ps	Ponting
Winterborne Tomson, St Andrew	y	y	y	Powys
Dorchester, Fordington, St George	x	x	y	Rev. Moule and Feacey
Shapwick, St Bartholomew	ps	ps	y	Rogers
Cerne Abbas, St Mary	y	ps	ps	T.H. Wyatt
Dewlish, All Saints	y	n	y	T.H. Wyatt
Hilfield, St Nicholas	y	n	x	Withers (poss roof only)
Milton Abbas, Abbey	y	n	n	Wyatt, Middleton, Scott
Abbotsbury, St Nicholas	y	y	y	x
Burleston, [? Dedication] ruin	n	y	ps	x
Charminster, St Mary	y	ps	x	x
Compton Abbas, Old Church (ruin)	n	n	y	x
Gussage St Andrew, St Andrew	y	ps	ps	x
Knowlton (inside circles), ruin	y	y	y	x
Langton Herring, St Peter	y	ps	y	x
Litton Cheyney, St Mary	ps	ps	y	x
Loders, St Mary Magdalene	y	ps	ps	x
Oborne, Old Church	y	y	x	x
Pilsdon, St Mary	y	y	x	x
Stinsford, St Michael	y	ps	ps	x
Stour Provost, St Michael	ps	y	n	x
Studland, St Nicholas	y	ps	ps	x
Tarrant Crawford, St Mary	y	y	y	x
Upwey, St Laurence	y	n	y	x
Wareham, St Martin	y	y	y	x
Whitcombe, [? Dedication]	y	y	y	x
Winfrith Newburgh, St Christopher	y	y	y	x
Winterborne St Martin, St Martin	y	y	ps	x
Winterborne Stickland, St Mary	y	y	y	x
Winterbourne Steepleton, St Michael	y	ps	ps	x

12.13 : Old plaster survival, (certain) by architect..

Surveyed churches by architect

Source : Pevsner supplemented by RCHM. Where sources differ, Pevsner is given precedence, except where this interpretation is contradicted by physical survey. See note in literature review.

Key : x = no evidence : n = no old plaster : ps = possible old plaster : y = definite old plaster

Church	Plaster survival: nave	chancel	other	Architect
East Stour, Christ Church	n	n	n	Alexander
Motcombe, St Mary	n	n	ps	Alexander
Sutton Waldron, St Bartholomew	n	n	n	Alexander
Broadwindsor, St John Baptist	ps	ps	ps	Allen
Corscombe, St Mary	n	n	n	Allen
Stoke Abbott, St Mary	ps	ps	n	Aubyn
Blandford Forum, St Peter and St Paul	n	n	n	Bastards, Hunt
Warmwell, Holy Trinity	y	n	x	Bennett
Wootton Fitzpaine, [? Dedication]	ps	ps	y	Birch
Melbury Osmond, St Osmond	ps	n	n	Blomfield
Woodlands, Ascension	n	n	n	Bodley
Wimborne St Giles, St Giles	n	n	n	Bodley, Comper
Canford Magna, [? Dedication]	n	n	n	Brandon
Cranborne, St Mary And St Bartholomew.	y	ps	y	Brandon
Askerswell, St Michael	ps	ps	ps	Bury
Eype, St Peter	n	n	n	Bury (Boulton carver)
Monkton Wyld, St Andrew	n	n	n	Carpenter
Gussage All Saints, All Saints	ps	ps	ps	Christian
Piddlehinton, St Mary	ps	n	ps	Christian
Winterborne Monkton, St Michael (RCHM S	ps	ps	ps	Christian
Bourton, St George	n	n	n	Christian, Ponting
Chaldon Herring, St Nicholas	n	n	n	Crickmay
Chideock, St Giles	ps	n	ps	Crickmay
Hooke, St Giles	ps	ps	ps	Crickmay
Langton Matravers, St George	n	n	y	Crickmay
Sixpenny Handley, St Mary	n	n	n	Crickmay
Turnworth, St Mary	n	n	n	Crickmay
Buckhorn Weston, St John Baptist	ps	ps	ps	Crickmay
West Milton, St Mary Magdalene	n	n	n	Crickmay ('worked with' Hansford)
Stratton, St Mary	n	n	n	Crickmay and son
Beer Hackett, St Michael	n	n	n	Crickmay, Ponting
Wareham, St Mary	n	ps	y	Donaldson
Ashmore, St Nicholas	n	n	n	Edwards
Compton Abbas, St Mary	n	n	n	Evans
Longburton, St James	ps	ps	ps	Farrall
Compton Valence, St Thomas of Canterbury	n	n	n	Ferrey
Frampton, St Mary	n	n	n	Ferrey
Little Bredy, St Michael	n	n	n	Ferrey
Melplash, Christ Church	n	n	n	Ferrey
Osmington, St Osmund	ps	ps	ps	Ferrey
Tarrant Hinton, St Mary	n	n	n	Ferrey
Tincleton, St John Evangelist	n	n	n	Ferrey
Winterborne Whitechurch, St Mary	n	ps	ps	Ferrey
Iwerne Courtney (Shroton), St Mary	ps	ps	ps	Freke

12.14 : Surveyed churches, by architect.

Portland, Easton, St George	n	n	n	Gilbert
Over Compton, St Michael	ps	n	ps	Goodden
Durweston, St Nicholas	n	n	n	Hardwick
Athelhampton, St John	n	n	n	Hicks
Batcombe, St Mary	n	n	n	Hicks
Bettiscombe, St Stephen	n	n	n	Hicks
Bridport, St Mary	x	n	n	Hicks
Compton Abbas West, [? Dedication]	n	n	n	Hicks
Coombe Keynes, Holy Rood	n	n	n	Hicks
Dorchester, St Peter	n	n	n	Hicks
North Poorton, St Mary Magdalene	n	n	n	Hicks
Okeford Fitzpaine, St Andrew	n	n	n	Hicks
Powerstock, St Mary	ps	n	ps	Hicks
Wool, Holy Rood	ps	n	ps	Hicks
West Knighton, St Peter	y	ps	y	Hicks (Hardy)
West Lulworth, Holy Trinity	n	n	n	Hicks (supervised by Crickmay)
Pulham, St Thomas Becket	ps	ps	ps	Hingeston-Randolph
Puncknowle, St Mary	y	y	y	Houghton-Spencer
Shillingstone, Holy Rood	ps	n	n	Hunt, Bodley
Owermoigne, St Michael	ps	ps	ps	Jackson
Milton Abbas, St James	n	n	n	James Wyatt, Fletcher
Winterborne Clenston, St Nicholas	n	n	n	Louis Vulliamy
Portland, Easton, St Andrew, (ruin)	n	n	n	Merrick
Hamworthy, St Michael	n	n	n	Morley and Bolden
Wynford Eagle, St Lawrence	n	n	n	Osborn
Mosterton, St Mary	ps	n	ps	Pearce
Blandford St Mary, St Mary	n	ps	n	Pitt
Ibberton, St Eustace	n	n	n	Ponting
Kingston Lacy, St Stephen	n	n	n	Ponting
Puddletown, St Mary	y	ps	ps	Ponting
West Stafford, St Andrew	y	ps	ps	Ponting
Gillingham, St Mary	n	ps	n	Ponting and Caroe
Winterborne Tomson, St Andrew	y	y	y	Powys
Bothenhampton, Holy Trinity	n	n	n	Prior
Burton Bradstock, St Mary	ps	ps	ps	Prior
Halstock, St Mary	ps	n	n	Pugin
Rampisham, St Michael	ps	ps	ps	Pugin, Hicks
Dorchester, Fordington, St George	x	x	y	Rev. Moule and Feacey
Trent, St Andrew	n	ps	n	Rev. William Henry Turner
Shapwick, St Bartholomew	ps	ps	y	Rogers
Hampreston, All Saints	n	n	n	Romaine-Walker and Tanner
Cattistock, St Peter and St Paul	n	n	n	Scott, Scott jnr
Evershot, St Osmund	n	n	n	Shout, Shout
Pentridge, St Rumbold	n	n	n	Slater
Chetnole, St Peter	n	n	n	Slater and Carpenter
Milton on Stour, St Simon and St Jude	n	n	n	Slater and Carpenter
Sherborne, Abbey	n	n	n	Slater and Carpenter
Thornford, St Mary Magdalene	n	n	n	Slater and Carpenter
South Perrott, St Mary	ps	ps	ps	Southcombe Parker
Gussage St Michael, St Michael	ps	ps	ps	Street
Winterborne Kingston, St Nicholas	n	n	n	Street
Fleet, Holy Trinity	n	n	n	Strickland
Affpuddle, St Laurence	ps	ps	n	T.H. Wyatt
Cerne Abbas, St Mary	y	ps	ps	T.H. Wyatt
Child Okeford, St Nicholas	n	n	n	T.H. Wyatt
Corfe Castle, St Edward	ps	n	n	T.H. Wyatt

12.14 : Surveyed churches, by architect, continued.

Dewlish, All Saints	y	n	y	T.H. Wyatt
Iwerne Minster, St Mary	ps	n	ps	T.H. Wyatt, Pearson
Morcombelake, St Gabriel	n	n	n	T.H. Wyatt and Brandon
Preston, St Andrew	ps	ps	ps	T.H. Wyatt
Spetisbury, St John Baptist	n	n	ps	T.H. Wyatt
Stourpaine, Holy Trinity	n	n	ps	T.H. Wyatt
Swanage, All Saints	n	n	n	T.H. Wyatt
Tarrant Gunville, St Mary	n	n	n	T.H. Wyatt
Tarrant Keyneston, All Saints	n	n	n	T.H. Wyatt
Tolpuddle, St John Evangelist	n	n	n	T.H. Wyatt
Wimborne Minster, St Cuthburga	ps	ps	ps	T.H. Wyatt, Pearson
Winterborne Houghton, St Andrew	n	n	n	T.H. Wyatt
Woodsford, St John Evangelist	n	n	n	T.H. Wyatt
Toller Porcorum, St Peter and St Andrew	n	ps	n	Taylor and Gordon
Kingston Magna, All Saints	n	n	n	Turner
Marshwood, St Mary	n	n	n	Vialls
Charmouth, St Andrew	n	n	n	Wallis (Poss Fowler)
Toller Whelme, St John	n	n	n	Warr
Beaminster, St Mary	ps	ps	ps	White
Leigh, St Andrew	ps	ps	n	Withers
Lillington, St Martin	ps	ps	ps	Withers
Melbury Bubb, St Mary	n	n	n	Withers (Builder Shout)
Hilfield, St Nicholas	y	n	x	Withers (poss roof only)
Sturminster Marshall, St Mary	n	n	n	Woodyer
Milton Abbas, Abbey	y	n	n	Wyatt, Middleton, Scott
Abbotsbury, Abbey	n	n	n	x
Abbotsbury, St Catherine's Chapel.	n	n	n	x
Abbotsbury, St Nicholas	y	y	y	x
Arne, St Nicholas	ps	ps	x	x
Belchalwell, St Aldhelm	ps	n	n	x
Bincombe, Holy Trinity	ps	ps	x	x
Bothenhampton, Old Church	ps	ps	x	x
Bradford Abbas, St Mary	n	n	n	x
Brownsea Island, St Mary	n	n	n	x
Buckland Ripers, St Nicholas	n	n	n	x
Burleston, [? Dedication] ruin	n	y	ps	x
Chalbury, All Saints	ps	ps	n	x
Charminster, St Mary	y	ps	x	x
Cheselbourne, St Martin	ps	ps	ps	x
Chickerell, St Mary	ps	ps	n	x
Chilfrome, Holy Trinity	n	n	n	x
Church Knowle, St Peter	ps	ps	ps	x
Compton Abbas, Old Church (ruin)	n	n	y	x
Corfe Mullen, St Hubert	ps	ps	ps	x
Edmondsham, St Nicholas	ps	ps	ps	x
Farnham, St Laurence	ps	n	n	x
Fifehead Magdalen, St Mary Magdalene	n	n	n	x
Fishpond, St John Baptist	n	n	n	x
Fleet, Old Church	n	ps	n	x
Frome St Quintin, St Quintin	n	ps	n	x
Frome Vauchurch, [? Dedication]	ps	ps	n	x
Godmanstone, Holy Trinity	ps	ps	ps	x
Gussage St Andrew, St Andrew	y	ps	ps	x
Kimmeridge, [? Dedication]	ps	ps	x	x
Knowlton (inside circles), ruin	y	y	y	x
Langton Herring, St Peter	y	ps	y	x

12.14 : Surveyed churches, by architect, continued.

Litton Cheyney, St Mary	ps	ps	y	x	
Loders, St Mary Magdalene	y	ps	ps	x	
Long Bredy, St Peter	n	ps	ps	x	
Long Crichel, St Mary	n	n	ps	x	
Lyme Regis, St Michael	ps	ps	n	x	
Maiden Newton, St Mary	ps	ps	ps	x	
Mapperton, All Saints	ps	ps	ps	x	
Minterne Magna, St Andrew	n	n	n	x	
Nether Cerne, All Saints	ps	ps	ps	x	
Nether Compton, St Nicholas	ps	ps	ps	x	
Netherbury, St Mary	ps	ps	x	x	
Oborne, Old Church	y	y	x	x	
Pamphill, St Margaret and St Andrew	ps	ps	ps	x	
Pilsdon, St Mary	y	y	x	x	
Portesham, St Peter	ps	ps	n	x	
Radipole, St Ann	ps	ps	ps	x	
Ryme Intrinseca, St Hippolyte	ps	ps	x	x	
Shaftesbury, St Peter	n	n	n	x	
Silton, St Nicholas	ps	ps	ps	x	
St Aldhelm's Head, St Aldhelm's Chapel	n	n	n	x	
Stanton St Gabriel, Old Church, ruin	n	n	n	x	
Steeple, St Michael	ps	ps	ps	x	
Stinsford, St Michael	y	ps	ps	x	
Stockwood, St Edwold	ps	x	x	x	
Stour Provost, St Michael	ps	y	n	x	
Studland, St Nicholas	y	ps	ps	x	
Swyre, Holy Trinity	ps	ps	x	x	
Sydling St Nicholas, St Nicholas	ps	ps	x	x	
Symondsbury, St John Baptist	ps	ps	ps	x	
Tarrant Crawford, St Mary	y	y	y	x	
Tarrant Monkton, All Saints	ps	ps	x	x	
Tarrant Rawston, St Mary	ps	ps	ps	x	
Tarrant Rushton, St Mary	n	n	n	x	
Toller Fratum, St Basil	n	n	n	x	
Turners Puddle, Holy Trinity	ps	ps	ps	x	
Upwey, St Laurence	y	n	y	x	
Wareham, Holy Trinity	n	n	n	x	
Wareham, St Martin	y	y	y	x	
West Chelborough, St Andrew	ps	ps	ps	x	
West Milton, Old Church	n	n	n	x	
West Parley, All Saints	n	n	n	x	
West Stour, St Mary	ps	ps	n	x	
Whitchurch Canonicorum, St Candida St Wi	ps	ps	ps	x	
Whitcombe, [? Dedication]	y	y	y	x	
Winfrith Newburgh, St Christopher	y	y	y	x	
Winterborne Came, St Peter	ps	ps	x	x	
Winterborne St Martin, St Martin	y	y	ps	x	
Winterborne Stickland, St Mary	y	y	y	x	
Winterbourne Abbas, St Mary	n	n	ps	x	
Winterbourne Steepleton, St Michael	y	ps	ps	x	
Witchampton, St Mary and St Cuthberga	n	n	n	x	
Worth Matravers, St Nicholas	ps	ps	ps	x	
Wraxall, St Mary	ps	ps	ps	x	
Yetminster, St Andrew	n	ps	n	x	

12.14 : Surveyed churches, by architect, continued.

All churches by parish population 1851

Source : Victoria County History p264-273

Key : x = no data : n = no old plaster : ps = possible old plaster : y = definite old plaster : 0 = data included under another church. Note the VCH lists population by 'civil parish' and not by 'historic ecclesiastical parish'. Together with ongoing 19th century reform of 'ecclesiastical parish' boundaries, this makes an *exact* match between historic boundaries and census figures impossible.

Church	Plaster survival			Population
	nave	chance	other	
Abbotsbury, Abbey	n	n	n	0
Abbotsbury, St Catherine's Chapel.	n	n	n	0
Abbotsbury, St Nicholas	y	y	y	1077
Affpuddle, St Laurence	ps	ps	n	488
Alderholt, St James	x	x	x	x
Almer, St Mary	x	x	x	185
Alton Pancras, St Pancras	x	x	x	282
Anderson, St Michael	x	x	x	59
Arne, St Nicholas	ps	ps	x	138
Ashmore, St Nicholas	n	n	n	237
Askerswell, St Michael	ps	ps	ps	224
Athelhampton, St John	n	n	n	82
Baindford Forum, St Leonard's Chapel	x	x	x	x
Batcombe, St Mary	n	n	n	227
Beaminster, Holy Trinity	x	x	x	x
Beaminster, St Mary	ps	ps	ps	2832
Beer Hackett, St Michael	n	n	n	107
Belchalwell, St Aldhelm	ps	n	n	222
Bere Regis, St John Baptist	x	x	x	1814
Bettiscombe, St Stephen	n	n	n	73
Bincombe, Holy Trinity	ps	ps	x	231
Bindon Abbey, ruin	x	x	x	x
Bishops Caundle, St Peter and St Paul	x	x	x	397
Blackdown, Holy Trinity	x	x	x	x
Blandford Forum, St Peter and St Paul	n	n	n	3948
Blandford St Mary, St Mary	n	ps	n	367
Bloxworth, St Andrew	x	x	x	283
Bothenhampton, Holy Trinity	n	n	n	x
Bothenhampton, Old Church	ps	ps	x	548
Bourton, St George	n	n	n	969
Boveridge, St Aldhelm	x	x	x	x
Bradford Abbas, St Mary	n	n	n	621
Bradford Peverell, St Mary	x	x	x	395
Bradpole, Holy Trinity	x	x	x	1391
Bridport, St Andrew	x	x	x	x
Bridport, St Mary	x	n	n	4653
Bridport, St Swithun	x	x	x	x
Broadmayne, St Martin	x	x	x	486
Broadoak, St Paul	x	x	x	x
Broadstone, St John Baptist	x	x	x	x
Broadwey, St Nicholas	x	x	x	610
Broadwindsor, St John Baptist	ps	ps	ps	1516

12.15 : All churches, by parish population.

Brownsea Island, St Mary	n	n	n	x
Buckhorn Weston, St John Baptist	ps	ps	ps	484
Buckland Newton, Holy Rood	x	x	x	990
Buckland Ripers, St Nicholas	n	n	n	111
Burleston, [? Dedication] ruin	n	y	ps	71
Burstock, St Andrew	x	x	x	234
Burton Bradstock, St Mary	ps	ps	ps	1181
Canford Magna, [? Dedication]	n	n	n	4065
Catherston Leweston, St Mary	x	x	x	32
Cattistock, St Peter and St Paul	n	n	n	594
Caundle Marsh, St Peter and St Paul	x	x	x	71
Cerne Abbas, St Mary	y	ps	ps	1343
Chalbury, All Saints	ps	ps	n	166
Chaldon Herring, St Nicholas	n	n	n	328
Charborough, St Mary	x	x	x	x
Charlton Marshall, St Mary	x	x	x	463
Charminster, St Mary	y	ps	x	905
Charmouth, St Andrew	n	n	n	664
Chedington, St James	x	x	x	189
Cheselbourne, St Martin	ps	ps	ps	408
Chetnole, St Peter	n	n	n	227
Chettle, St Mary	x	x	x	149
Chickerell, St Mary	ps	ps	n	577
Chideock, St Giles	ps	n	ps	884
Chilcombe, [? Dedication]	x	x	x	29
Child Okeford, St Nicholas	n	n	n	773
Chilfrome, Holy Trinity	n	n	n	119
Church Knowle, St Peter	ps	ps	ps	480
Colehill, St Michael	x	x	x	x
Compton Abbas West, [? Dedication]	n	n	n	100
Compton Abbas, Old Church (ruin)	n	n	y	0
Compton Abbas, St Mary	n	n	n	465
Compton Valence, St Thomas of Canterbury	n	n	n	137
Coombe Keynes, Holy Rood	n	n	n	154
Corfe Castle, St Edward	ps	n	n	1966
Corfe Mullen, St Hubert	ps	ps	ps	763
Corscombe, St Mary	n	n	n	772
Cranborne, St Mary And St Bartholomew.	y	ps	y	2737
Creech Grange, St John Evangelist	x	x	x	x
Dewlish, All Saints	y	n	y	442
Dorchester, All Saints	x	x	x	814
Dorchester, Fordington, St George	x	x	y	3147
Dorchester, Holy Trinity	x	x	x	1549
Dorchester, St Mary	x	x	x	x
Dorchester, St Peter	n	n	n	1150
Drimpton, St Mary	x	x	x	x
Durweston, St Nicholas	n	n	n	406
East Burton, [? dedication]	x	x	x	x
East Holme, St John Evangelist	x	x	x	61
East Lulworth, St Andrew	x	x	x	450
East Orchard, St Thomas	x	x	x	219
East Stoke, St Mary	x	x	x	630
East Stour, Christ Church	n	n	n	538
Edmondsham, St Nicholas	ps	ps	ps	286
Enmore Green, St John Evangelist	x	x	x	x
Evershot, St Osmund	n	n	n	606

12.15 : All churches, by parish population, continued.

Eype, St Peter	n	n	n	x	
Farnham, St Laurence	ps	n	n		128
Farrington, St Peter	x	x	x	x	
Fifehead Magdalen, St Mary Magdalene	n	n	n		218
Fifehead Neville, All Saints	x	x	x		95
Fishpond, St John Baptist	n	n	n	x	
Fleet, Holy Trinity	n	n	n		164
Fleet, Old Church	n	ps	n		0
Folke, St Lawrence	x	x	x		330
Fontmell Magna, St Andrew	x	x	x		832
Forde Abbey	x	x	x	x	
Frampton, St Mary	n	n	n		392
Frome St Quintin, St Quintin	n	ps	n		184
Frome Vauchurch, [? Dedication]	ps	ps	n		171
Gillingham, St Mary	n	ps	n		2806
Glanvilles Wooton, St Mary	x	x	x		328
Goathill, St Peter	x	x	x	x	
Godmanstone, Holy Trinity	ps	ps	ps		179
Gussage All Saints, All Saints	ps	ps	ps		477
Gussage St Andrew, St Andrew	y	ps	ps	x	
Gussage St Michael, St Michael	ps	ps	ps		302
Halstock, St Mary	ps	n	n		572
Hammoon, St Paul	x	x	x		73
Hampreston, All Saints	n	n	n		1387
Hamworthy, St Michael	n	n	n		351
Hanford, St Michael and all Angels	x	x	x		5
Haydon, St Catherine	x	x	x		109
Hazelbury Bryan, St Mary and St James	x	x	x		709
Hermitage, St Mary	x	x	x		139
Hilfield, St Nicholas	y	n	x		124
Hilton, All Saints	x	x	x		761
Hinton Martell, St John Evangelist	x	x	x		324
Hinton Parva, St Kenelm	x	x	x		55
Hinton St Mary, St Peter	x	x	x		345
Holnest, St Mary	x	x	x		163
Holt, St James	x	x	x	x	
Holwell, St Lawrence	x	x	x		462
Hooke, St Giles	ps	ps	ps		261
Horton, St Wolfreda	x	x	x		440
Ibberton, St Eustace	n	n	n		218
Iwerne Courtney (Shroton), St Mary	ps	ps	ps		689
Iwerne Minster, St Mary	ps	n	ps		703
Iwerne Stepleton, St Mary	x	x	x		44
Kimmeridge, [? Dedication]	ps	ps	x		178
Kingston Lacy, St Stephen	n	n	n	x	
Kingston Magna, All Saints	n	n	n		652
Kingston, Old Church	x	x	x		0
Kingston, St James	x	x	x		84
Knowlton (inside circles), ruin	y	y	y	x	
Langton Herring, St Peter	y	ps	y		246
Langton Long (Blandford), All Saints	x	x	x		183
Langton Matravers, St George	n	n	y		762
Leigh, St Andrew	ps	ps	n		440
Lewcombe, St James	x	x	x	x	
Leweston, Holy Trinity	x	x	x	x	
Lillington, St Martin	ps	ps	ps		174

12.15 : All churches, by parish population, continued.

Little Bredy, St Michael	n	n	n		226
Litton Cheyney, St Mary	ps	ps	y		507
Loders, St Mary Magdalene	y	ps	ps		986
Long Bredy, St Peter	n	ps	ps		375
Long Crichel, St Mary	n	n	ps		144
Longburton, St James	ps	ps	ps		389
Lydlinch, St Thomas Becket	x	x	x		407
Lyme Regis, St Michael	ps	ps	n		2852
Lyscombe, ruin	x	x	x	x	
Lytchett Heath, St Aldhelm	x	x	x	x	
Lytchett Matravers, St Mary	x	x	x		878
Lytchett Minster, [? Dedication]	x	x	x		878
Maiden Newton, St Mary	ps	ps	ps		821
Manston, St Nicholas	x	x	x		134
Mapperton, All Saints	ps	ps	ps		85
Mappowder, St Peter and St Paul	x	x	x		290
Margaret Marsh, St Margaret	x	x	x		77
Marnhull, St Gregory	x	x	x		1481
Marshwood, St Mary	n	n	n		520
Melbury Abbas, St Thomas	x	x	x		444
Melbury Bubb, St Mary	n	n	n		157
Melbury Osmond, St Osmond	ps	n	n		364
Melbury Sampford, St Mary	x	x	x		55
Melcombe Horsey, St Andrew	x	x	x		191
Melplash, Christ Church	n	n	n	x	
Milborne St Andrew, St Andrew	x	x	x		335
Milton Abbas, Abbey	y	n	n	x	
Milton Abbas, St catherine's chapel	x	x	x		0
Milton Abbas, St James	n	n	n		915
Milton on Stour, St Simon and St Jude	n	n	n	x	
Minterne Magna, St Andrew	n	n	n		396
Monkton Wyld, St Andrew	n	n	n	x	
Morcombelake, St Gabriel	n	n	n	x	
Morden, St Mary	x	x	x		1018
More Crichel, St Mary	x	x	x		374
Moreton, St Nicholas	x	x	x		227
Mosterton, St Mary	ps	n	ps		346
Motcombe, St Mary	n	n	ps		1535
Nether Cerne, All Saints	ps	ps	ps		103
Nether Compton, St Nicholas	ps	ps	ps		454
Netherbury, St Mary	ps	ps	x		2066
North Poorton, St Mary Magdalene	n	n	n		109
North Wooton, Old Church (ruin)	x	x	x		0
North Wooton, St Mary Magdalene	x	x	x		75
Oborne, Old Church	y	y	x		0
Oborne, St Cuthbert	x	x	x		140
Okeford Fitzpaine, St Andrew	n	n	n		643
Osmington, St Osmund	ps	ps	ps		485
Over Compton, St Michael	ps	n	ps		158
Owermoigne, St Michael	ps	ps	ps		400
Pamphill, St Margaret and St Andrew	ps	ps	ps	x	
Pentridge, St Rumbold	n	n	n		256
Piddlehinton, St Mary	ps	n	ps	x	
Piddletrenthide, All Saints	x	x	x		800
Pilsdon, St Mary	y	y	x		95
Pimperne, St Peter	x	x	x		517

12.15 : All churches, by parish population, continued.

Plush, St John Baptist	x	x	x	x	
Poole, (Branksome Park), All Saints	x	x	x		0
Poole, (Branksome), St Aldhelm	x	x	x		0
Poole, (Branksome), St Clement	x	x	x		0
Poole, (Longfleet), St Mary	x	x	x		0
Poole, (Parkstone), St Peter	x	x	x		0
Poole, St James	x	x	x		6718
Portesham, (Corton), St Bartholomew	x	x	x	x	
Portesham, St Peter	ps	ps	n		767
Portland, Easton, St George	n	n	n		5195
Portland, Easton, St Andrew, (ruin)	n	n	n		0
Portland, Fortuneswell, St John Baptist	x	x	x	x	
Portland, Grove, St Peter	x	x	x	x	
Portland, Southwell, St Andrew	x	x	x	x	
Powerstock, St Mary	ps	n	ps		1044
Poxwell, St John Evangelist (pulled down)	x	x	x	x	
Poxwell, StJohn the Baptist	x	x	x		69
Poyntington, All Saints	x	x	x	x	
Preston, St Andrew	ps	ps	ps		711
Puddletown, St Mary	y	ps	ps		1297
Pulham, St Thomas Becket	ps	ps	ps		288
Puncknowle, St Mary	y	y	y		467
Purse Caundle, St Peter	x	x	x		177
Radipole, St Ann	ps	ps	ps		609
Rampisham, St Michael	ps	ps	ps		412
Ryme Intrinseca, St Hippolyte	ps	ps	x		216
Salway Ash, Holy Trinity	x	x	x	x	
Sandford Orcas, St Nicholas	x	x	x	x	
Seaborough, St John	x	x	x	x	
Shaftesbury (Cann), St Rumbold	x	x	x		513
Shaftesbury, Holy Trinity	x	x	x		1122
Shaftesbury, St James	x	x	x		919
Shaftesbury, St Peter	n	n	n		1032
Shapwick, St Bartholomew	ps	ps	y		444
Sherborne, Abbey	n	n	n		0
Sherborne, St Mary Magdalene	x	x	x		5242
Shillingstone, Holy Rood	ps	n	n		503
Shipton Gorge, St Martin	x	x	x		408
Silton, St Nicholas	ps	ps	ps		368
Sixpenny Handley, St Mary	n	n	n		1229
South Perrott, St Mary	ps	ps	ps		374
Spetisbury, St John Baptist	n	n	ps		660
St Aldhelm's Head, St Aldhelm's Chapel	n	n	n	x	
Stalbridge, St Mary	x	x	x		1901
Stanton St Gabriel, Old Church, ruin	n	n	n		90
Steeple, St Michael	ps	ps	ps		270
Stinsford, St Michael	y	ps	ps		373
Stock Gaylard, St Barnabas	x	x	x		65
Stockwood, St Edwold	ps	x	x		43
Stoke Abbott, St Mary	ps	ps	n		826
Stoke Wake, All Saints	x	x	x		124
Stour Provost, St Michael	ps	y	n		869
Stour Row, All Saints	x	x	x	x	
Stourpaine, Holy Trinity	n	n	ps		621
Stourton Caundle, St Peter	x	x	x		450
Stratton, St Mary	n	n	n		394

12.15 : All churches, by parish population, continued.

Studland, St Nicholas	y	ps	ps		445
Sturminster Marshall, St Mary	n	n	n		872
Sturminster Newton, St Mary	x	x	x		1916
Sutton Waldron, St Bartholomew	n	n	n		257
Swanage (Herston), St Mark	x	x	x	x	
Swanage, All Saints	n	n	n		2139
Swyre, Holy Trinity	ps	ps	x		254
Sydling St Nicholas, St Nicholas	ps	ps	x		675
Symondsbury, St John Baptist	ps	ps	ps		1395
Tarrant Crawford, St Mary	y	y	y		77
Tarrant Gunville, St Mary	n	n	n		475
Tarrant Hinton, St Mary	n	n	n		319
Tarrant Keyneston, All Saints	n	n	n		321
Tarrant Monkton, All Saints	ps	ps	x		255
Tarrant Rawston, St Mary	ps	ps	ps		66
Tarrant Rushton, St Mary	n	n	n		196
Thorncombe, St Mary	x	x	x		1317
Thornford, St Mary Magdalene	n	n	n		410
Tincleton, St John Evangelist	n	n	n		176
Todber, [? Dedication]	x	x	x		119
Toller Fratum, St Basil	n	n	n		217
Toller Porcorum, St Peter and St Andrew	n	ps	n		527
Toller Whelme, St John	n	n	n	x	
Tolpuddle, St John Evangelist	n	n	n		354
Trent, St Andrew	n	ps	n	x	
Turners Puddle, Holy Trinity	ps	ps	ps		109
Turnworth, St Mary	n	n	n		103
Tyneham, St Mary	x	x	x		276
Upcerne, [? Dedication]	x	x	x		94
Upwey, St Laurence	y	n	y		637
Verwood, St Michael	x	x	x	x	
Walditch, St Mary	x	x	x		176
Wareham, Holy Trinity	n	n	n		876
Wareham, St Martin	y	y	y		596
Wareham, St Mary	n	ps	y		1606
Warmwell, Holy Trinity	y	n	x		149
West Chelborough, St Andrew	ps	ps	ps		64
West Knighton, St Peter	y	ps	y		270
West Lulworth, Holy Trinity	n	n	n		401
West Milton, Old Church	n	n	n	x	
West Milton, St Mary Magdalene	n	n	n	x	
West Moors, St John	x	x	x	x	
West Moors, St Mary	x	x	x	x	
West Orchard, [? Dedication]	x	x	x		121
West Parley, All Saints	n	n	n		286
West Stafford, St Andrew	y	ps	ps		229
West Stour, St Mary	ps	ps	n		221
Weymouth, Holy Trinity	x	x	x		5273
Weymouth, St John	x	x	x		2957
Weymouth, St Martin	x	x	x		0
Weymouth, St Mary	x	x	x		0
Weymouth, St Paul	x	x	x		0
Whitchurch Canonicorum, St Candida St Wite	ps	ps	ps		1532
Whitcombe, [? Dedication]	y	y	y		61
Wimborne Minster, St Cuthburga	ps	ps	ps		4759
Wimborne St Giles, St Giles	n	n	n		495

12.15 : All churches, by parish population, continued.

Wimborne, Leigh, St John Evangelist	x	x	x	x	
Winfrith Newburgh, St Christopher	y	y	y		1101
Winterborne Came, St Peter	ps	ps	x		150
Winterborne Clenston, St Nicholas	n	n	n		97
Winterborne Houghton, St Andrew	n	n	n		313
Winterborne Kingston, St Nicholas	n	n	n		584
Winterborne Monkton, St Michael (RCHM St Simon) ar	ps	ps	ps		87
Winterborne St Martin, St Martin	y	y	ps		434
Winterborne Stickland, St Mary	y	y	y		407
Winterborne Tomson, St Andrew	y	y	y		37
Winterborne Whitechurch, St Mary	n	ps	ps		595
Winterborne Zelston, St Mary	x	x	x		224
Winterbourne Abbas, St Mary	n	n	ps		195
Winterbourne Steepleton, St Michael	y	ps	ps		206
Witchampton, St Mary and St Cuthberga	n	n	n		504
Woodlands, Ascension	n	n	n		476
Woodsford, St John Evangelist	n	n	n		183
Wool, Holy Rood	ps	n	ps		545
Woolland, [? Dedication]	x	x	x		107
Wootton Fitzpaine, [? Dedication]	ps	ps	y		361
Worth Matravers, St Nicholas	ps	ps	ps		396
Wraxall, St Mary	ps	ps	ps		87
Wyke Regis, All Saints	x	x	x		1898
Wynford Eagle, St Lawrence	n	n	n	x	
Yetminster, St Andrew	n	ps	n		666

12.15 : All churches, by parish population, continued.

Surveyed churches by parish population 1851

Source : Victoria County History p264-273

Key : x = no data : n = no old plaster : ps = possible old plaster : y = definite old plaster : 0 = data included under another church. Note the VCH lists population by 'civil parish' and not by 'historic ecclesiastical parish'. Together with ongoing 19th century reform of 'ecclesiatical parish' boundaries, this makes an *exact* match between historic boundaries and census figures impossible.

Church	Plaster survival			Population
	nave	chance	other	
Abbotsbury, Abbey	n	n	n	0
Abbotsbury, St Catherine's Chapel.	n	n	n	0
Compton Abbas, Old Church (ruin)	n	n	y	0
Fleet, Old Church	n	ps	n	0
Oborne, Old Church	y	y	x	0
Portland, Easton, St Andrew, (ruin)	n	n	n	0
Sherborne, Abbey	n	n	n	0
Winterborne Tomson, St Andrew	y	y	y	37
Stockwood, St Edwold	ps	x	x	43
Whitcombe, [? Dedication]	y	y	y	61
West Chelborough, St Andrew	ps	ps	ps	64
Tarrant Rawston, St Mary	ps	ps	ps	66
Burleston, [? Dedication] ruin	n	y	ps	71
Bettiscombe, St Stephen	n	n	n	73
Tarrant Crawford, St Mary	y	y	y	77
Athelhampton, St John	n	n	n	82
Mapperton, All Saints	ps	ps	ps	85
Winterborne Monkton, St Michael (RCHM St Simon) ar	ps	ps	ps	87
Wraxall, St Mary	ps	ps	ps	87
Stanton St Gabriel, Old Church, ruin	n	n	n	90
Pilsdon, St Mary	y	y	x	95
Winterborne Clenston, St Nicholas	n	n	n	97
Compton Abbas West, [? Dedication]	n	n	n	100
Nether Cerne, All Saints	ps	ps	ps	103
Turnworth, St Mary	n	n	n	103
Beer Hackett, St Michael	n	n	n	107
North Poorton, St Mary Magdalene	n	n	n	109
Turners Puddle, Holy Trinity	ps	ps	ps	109
Buckland Ripers, St Nicholas	n	n	n	111
Chilfrome, Holy Trinity	n	n	n	119
Hilfield, St Nicholas	y	n	x	124
Farnham, St Laurence	ps	n	n	128
Compton Valence, St Thomas of Canterbury	n	n	n	137
Arne, St Nicholas	ps	ps	x	138
Long Crichel, St Mary	n	n	ps	144
Warmwell, Holy Trinity	y	n	x	149
Winterborne Came, St Peter	ps	ps	x	150
Coombe Keynes, Holy Rood	n	n	n	154
Melbury Bubb, St Mary	n	n	n	157
Over Compton, St Michael	ps	n	ps	158
Fleet, Holy Trinity	n	n	n	164
Chalbury, All Saints	ps	ps	n	166
Frome Vauchurch, [? Dedication]	ps	ps	n	171
Lillington, St Martin	ps	ps	ps	174

12.16 : Surveyed churches, by parish population.

Tincleton, St John Evangelist	n	n	n	176
Kimmeridge, [? Dedication]	ps	ps	x	178
Godmanstone, Holy Trinity	ps	ps	ps	179
Woodsford, St John Evangelist	n	n	n	183
Frome St Quintin, St Quintin	n	ps	n	184
Winterbourne Abbas, St Mary	n	n	ps	195
Tarrant Rushton, St Mary	n	n	n	196
Winterbourne Steepleton, St Michael	y	ps	ps	206
Ryme Intrinseca, St Hippolyte	ps	ps	x	216
Toller Fratum, St Basil	n	n	n	217
Fifehead Magdalen, St Mary Magdalene	n	n	n	218
Ibberton, St Eustace	n	n	n	218
West Stour, St Mary	ps	ps	n	221
Belchalwell, St Aldhelm	ps	n	n	222
Askerswell, St Michael	ps	ps	ps	224
Little Bredy, St Michael	n	n	n	226
Batcombe, St Mary	n	n	n	227
Chetnole, St Peter	n	n	n	227
West Stafford, St Andrew	y	ps	ps	229
Bincombe, Holy Trinity	ps	ps	x	231
Ashmore, St Nicholas	n	n	n	237
Langton Herring, St Peter	y	ps	y	246
Swyre, Holy Trinity	ps	ps	x	254
Tarrant Monkton, All Saints	ps	ps	x	255
Pentridge, St Rumbold	n	n	n	256
Sutton Waldron, St Bartholomew	n	n	n	257
Hooke, St Giles	ps	ps	ps	261
Steeple, St Michael	ps	ps	ps	270
West Knighton, St Peter	y	ps	y	270
Edmondsham, St Nicholas	ps	ps	ps	286
West Parley, All Saints	n	n	n	286
Pulham, St Thomas Becket	ps	ps	ps	288
Gussage St Michael, St Michael	ps	ps	ps	302
Winterborne Houghton, St Andrew	n	n	n	313
Tarrant Hinton, St Mary	n	n	n	319
Tarrant Keyneston, All Saints	n	n	n	321
Chaldon Herring, St Nicholas	n	n	n	328
Mosterton, St Mary	ps	n	ps	346
Hamworthy, St Michael	n	n	n	351
Tolpuddle, St John Evangelist	n	n	n	354
Wootton Fitzpaine, [? Dedication]	ps	ps	y	361
Melbury Osmond, St Osmond	ps	n	n	364
Blandford St Mary, St Mary	n	ps	n	367
Silton, St Nicholas	ps	ps	ps	368
Stinsford, St Michael	y	ps	ps	373
South Perrott, St Mary	ps	ps	ps	374
Long Bredy, St Peter	n	ps	ps	375
Longburton, St James	ps	ps	ps	389
Frampton, St Mary	n	n	n	392
Stratton, St Mary	n	n	n	394
Minterne Magna, St Andrew	n	n	n	396
Worth Matravers, St Nicholas	ps	ps	ps	396
Owermoigne, St Michael	ps	ps	ps	400
West Lulworth, Holy Trinity	n	n	n	401
Durweston, St Nicholas	n	n	n	406
Winterborne Stickland, St Mary	y	y	y	407

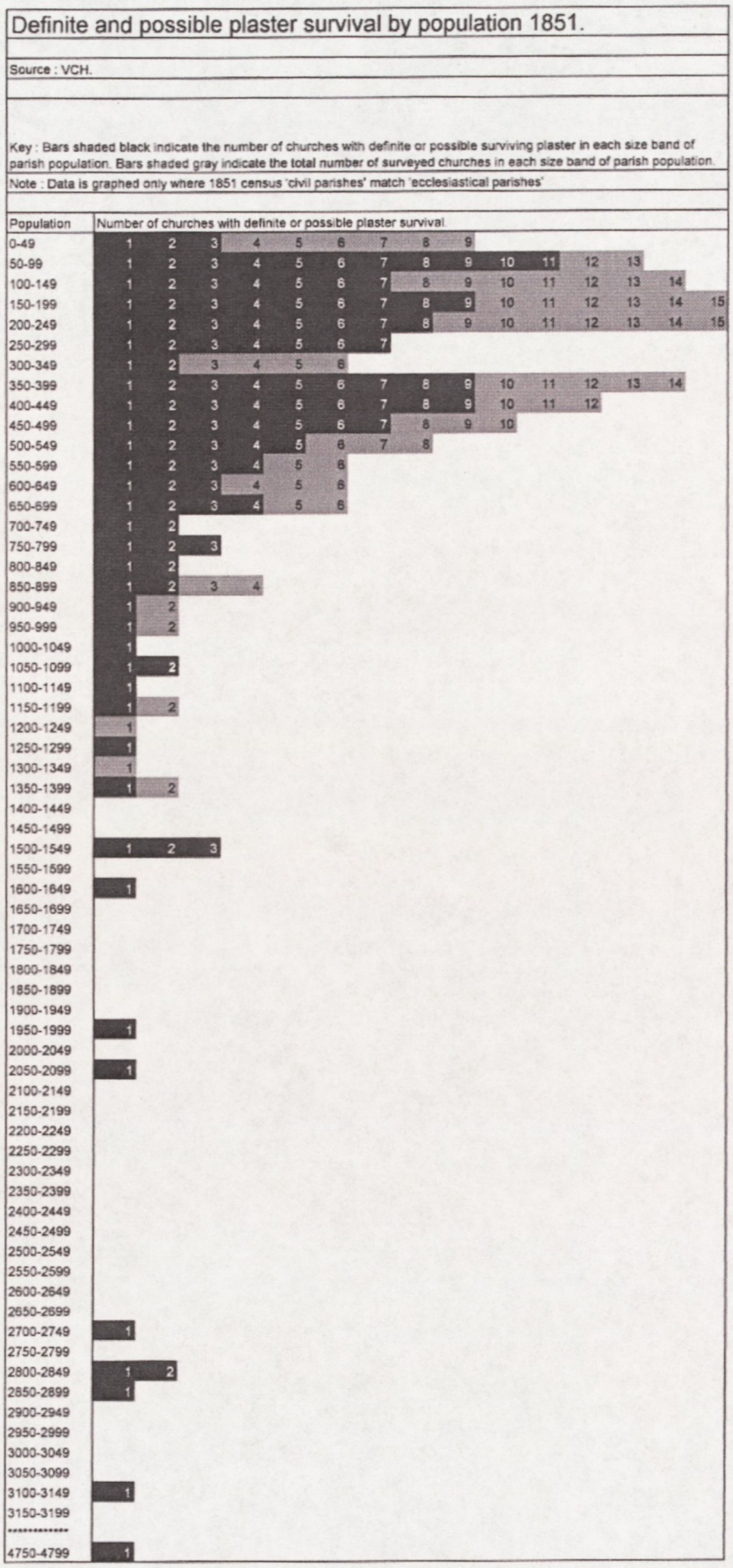
12.16 : Surveyed churches, by parish population, continued.

Cheselbourne, St Martin	ps	ps	ps	408
Thornford, St Mary Magdalene	n	n	n	410
Rampisham, St Michael	ps	ps	ps	412
Winterborne St Martin, St Martin	y	y	ps	434
Leigh, St Andrew	ps	ps	n	440
Dewlish, All Saints	y	n	y	442
Shapwick, St Bartholomew	ps	ps	y	444
Studland, St Nicholas	y	ps	ps	445
Nether Compton, St Nicholas	ps	ps	ps	454
Compton Abbas, St Mary	n	n	n	465
Puncknowle, St Mary	y	y	y	467
Tarrant Gunville, St Mary	n	n	n	475
Woodlands, Ascension	n	n	n	476
Gussage All Saints, All Saints	ps	ps	ps	477
Church Knowle, St Peter	ps	ps	ps	480
Buckhorn Weston, St John Baptist	ps	ps	ps	484
Osmington, St Osmund	ps	ps	ps	485
Affpuddle, St Laurence	ps	ps	n	488
Wimborne St Giles, St Giles	n	n	n	495
Shillingstone, Holy Rood	ps	n	n	503
Witchampton, St Mary and St Cuthberga	n	n	n	504
Litton Cheyney, St Mary	ps	ps	y	507
Marshwood, St Mary	n	n	n	520
Toller Porcorum, St Peter and St Andrew	n	ps	n	527
East Stour, Christ Church	n	n	n	538
Wool, Holy Rood	ps	n	ps	545
Bothenhampton, Old Church	ps	ps	x	548
Halstock, St Mary	ps	n	n	572
Chickerell, St Mary	ps	ps	n	577
Winterborne Kingston, St Nicholas	n	n	n	584
Cattistock, St Peter and St Paul	n	n	n	594
Winterborne Whitechurch, St Mary	n	ps	ps	595
Wareham, St Martin	y	y	y	596
Evershot, St Osmund	n	n	n	606
Radipole, St Ann	ps	ps	ps	609
Bradford Abbas, St Mary	n	n	n	621
Stourpaine, Holy Trinity	n	n	ps	621
Upwey, St Laurence	y	n	y	637
Okeford Fitzpaine, St Andrew	n	n	n	643
Kingston Magna, All Saints	n	n	n	652
Spetisbury, St John Baptist	n	n	ps	660
Charmouth, St Andrew	n	n	n	664
Yetminster, St Andrew	n	ps	n	666
Sydling St Nicholas, St Nicholas	ps	ps	x	675
Iwerne Courtney (Shroton), St Mary	ps	ps	ps	689
Iwerne Minster, St Mary	ps	n	ps	703
Preston, St Andrew	ps	ps	ps	711
Langton Matravers, St George	n	n	y	762
Corfe Mullen, St Hubert	ps	ps	ps	763
Portesham, St Peter	ps	ps	n	767
Corscombe, St Mary	n	n	n	772
Child Okeford, St Nicholas	n	n	n	773
Maiden Newton, St Mary	ps	ps	ps	821
Stoke Abbott, St Mary	ps	ps	n	826
Stour Provost, St Michael	ps	y	n	869
Sturminster Marshall, St Mary	n	n	n	872

12.16 : Surveyed churches, by parish population, continued.

Wareham, Holy Trinity	n	n	n		876
Chideock, St Giles	ps	n	ps		884
Charminster, St Mary	y	ps	x		905
Milton Abbas, St James	n	n	n		915
Bourton, St George	n	n	n		969
Loders, St Mary Magdalene	y	ps	ps		986
Shaftesbury, St Peter	n	n	n		1032
Powerstock, St Mary	ps	n	ps		1044
Abbotsbury, St Nicholas	y	y	y		1077
Winfrith Newburgh, St Christopher	y	y	y		1101
Dorchester, St Peter	n	n	n		1150
Burton Bradstock, St Mary	ps	ps	ps		1181
Sixpenny Handley, St Mary	n	n	n		1229
Puddletown, St Mary	y	ps	ps		1297
Cerne Abbas, St Mary	y	ps	ps		1343
Hampreston, All Saints	n	n	n		1387
Symondsbury, St John Baptist	ps	ps	ps		1395
Broadwindsor, St John Baptist	ps	ps	ps		1516
Whitchurch Canonicorum, St Candida St Wite	ps	ps	ps		1532
Motcombe, St Mary	n	n	ps		1535
Wareham, St Mary	n	ps	y		1606
Corfe Castle, St Edward	ps	n	n		1966
Netherbury, St Mary	ps	ps	x		2066
Swanage, All Saints	n	n	n		2139
Cranborne, St Mary And St Bartholomew.	y	ps	y		2737
Gillingham, St Mary	n	ps	n		2806
Beaminster, St Mary	ps	ps	ps		2832
Lyme Regis, St Michael	ps	ps	n		2852
Dorchester, Fordington, St George	x	x	y		3147
Blandford Forum, St Peter and St Paul	n	n	n		3948
Canford Magna, [? Dedication]	n	n	n		4065
Bridport, St Mary	x	n	n		4653
Wimborne Minster, St Cuthburga	ps	ps	ps		4759
Portland, Easton, St George	n	n	n		5195
Beaminster, Holy Trinity	x	x	x	x	
Bothenhampton, Holy Trinity	n	n	n	x	
Brownsea Island, St Mary	n	n	n	x	
Eype, St Peter	n	n	n	x	
Fishpond, St John Baptist	n	n	n	x	
Gussage St Andrew, St Andrew	y	ps	ps	x	
Kingston Lacy, St Stephen	n	n	n	x	
Knowlton (inside circles), ruin	y	y	y	x	
Melplash, Christ Church	n	n	n	x	
Milton Abbas, Abbey	y	n	n	x	
Milton on Stour, St Simon and St Jude	n	n	n	x	
Monkton Wyld, St Andrew	n	n	n	x	
Morcombelake, St Gabriel	n	n	n	x	
Pamphill, St Margaret and St Andrew	ps	ps	ps	x	
Piddlehinton, St Mary	ps	n	ps	x	
St Aldhelm's Head, St Aldhelm's Chapel	n	n	n	x	
Toller Whelme, St John	n	n	n	x	
Trent, St Andrew	n	ps	n	x	
West Milton, Old Church	n	n	n	x	
West Milton, St Mary Magdalene	n	n	n	x	
Wynford Eagle, St Lawrence	n	n	n	x	

12.16 : Surveyed churches, by parish population, continued.



12.17 : Definite and possible plaster survival, graphed by population.

Overskim (definite and possible)

Data source : original field survey by author with assistance.

Only churches visited during field survey are included in this list.

Key : x = no data : n = no old plaster : ps = possible old plaster and/or overskim (shaded rows) : y = definite old plaster and/or overskim (unshaded rows).

This table lists churches where old plaster is likely or possibly to be found under a later 'overskim' of modern plaster. This list does not correspond directly with the lists of surviving old plaster as it is possible for a church to have visible old plaster but no evidence of overskim. It is also possible for a church to have overskim without having any visible old plaster.

Church	Plaster survival				
	nave	chancel	other	overskim	
Affpuddle St Laurence	ps	ps	y	y	probable survival under 19th overskim
Askerswell. St. Michael	ps	ps	ps	y	definite fragments in tower base. much hollow sounding 19th overskim.
Beaminster St. Mary	ps	ps	ps	y	very large and complex.19th or 20th overskim throughout
Bincombe Holy Trinity	ps	ps		y	survey by A and G. overskim very thick at low level
Blandford St. Mary St. Mary	n	ps	n	y	possible overskim in chancel
Bothenhampton Old Church	ps	ps		y	possible under ?19th overskim. CCT. present architect Philip Hughes.
Broadwindsor St. John Baptist	ps	ps	ps	y	possible 19th overskim to all areas, though less likely in chancel.
Burton Bradstock St. Mary	ps	ps	ps	y	19th overskim throughout
Cerne Abbas St. Mary	y	ps	ps	y	heavily restored in 1961. visible 17th texts and part of doom. modern pastiches.
Charminster St. Mary	y	ps		y	extensive visible survival in nave. 19th century overskim in chancel. texts and patch of pomegranates.
Cheselbourne St. Martin	ps	ps	ps	y	very thick 19th or 20th overskim. no direct evidence of old plaster. recent bell frame destruction, with headstock lying outside.
Chickerell St. Mary	ps	ps	n	y	south nave and chancel possible under 19th overskim. 'real Dorset' 19th north aisle (see church knowle).
Chideock St. Giles	ps	n	ps	y	possible under dado level 19th overskim and on south arcade spandrels. also ps. in tower and north transept. chancel all new 19th. rest stripped.
Church Knowle St. Peter	ps	ps	ps	y	all surfaces likely to have 19th overskim. extraordinary 19th gallery.
Corfe Castle St. Edward	ps	n	n	ps	very slight possibility of old plaster under 19th overskim around chancel arch.

12.18 : Overskim, definite and possible, transcript of field notes.

Corfe Mullen St. Hubert	ps	ps	ps	ps	locked. inspection through windows. all 19th plaster but possibly overskim.
Cranborne St Mary And St. Bartholomew.	y	ps	y	ps	extensive survival with mural paintings.
Dewlish All Saints	y	n	y	ps	17th and 18th mural painting. 19th tiles in chancel. embroidery. badly broken font.
Dorchester St. George, Fordington			y	ps	survey by A and G. survival behind cupboard
Edmondsham St. Nicholas	ps	ps	ps	ps	locked, but very possible plaster survival. second survey by Gilly and jane. also locked. they share my view.
Fleet Old Church.	n	ps	n	ps	all visible plaster 19th. may be overskim. nave destroyed in 1824 flood.
Godmanstone Holy Trinity	ps	ps	ps	y	survey by G and A. overskim throughout.
Gussage All Saints	ps	ps	ps	ps	very slight possibility of 19th overskim. original survey notes record "none" in plaster survival columns, but contradict this with notes. ps. all 19th. with reused 14th windows.
Gussage St. Michael	ps	ps	ps	ps	very slight possibility of 19th overskim. exact areas for this not recorded in original survey.
Halstock St. Mary	ps	n	n	ps	very slight possibility of survival on nave west wall.
Iwerne Minster St. Mary	ps	n	ps	y	unlikely but possible under 19th overskim. better chance under very thick overskim in south porch.
Kimmeridge	ps	ps		ps	possible under 19th overskim
Langton Herring St. Peter	y	ps	y	ps	very likely on chancel arch abutments. possible overskim in rest of nave and chancel. also very likely on nave west wall.
Leigh St. Andrew	ps	ps	n	y	19th overskim. poss gravestone to repair. Vicar 01935 872237
Lillington St. Martin	ps	ps	ps	y	very thick 19th. overskim throughout.
Litton Cheyney	ps	ps	y	y	overskim in porch.
Loders St. Mary Magdalene	y	ps	ps	ps	very complex with much 19th. reworking. exposed mural painting on west wall of nave. prime candidate for testing.
Long Bredy St. Peter	n	ps	ps	ps	possible overskim in tower.
Longburton St. James	ps	ps	ps	ps	locked. doubtful overskim. appears all 19th.
Lyme Regis St Michael	ps	ps	n	ps	very complex. perp nave and chancel with 11th/13th nave used as porch. 'old' bits stripped in 20th possible 19th overskim elsewhere.
Maiden Newton St. Mary	ps	ps	ps	ps	Notes from 09.98 say "19th scraped plus some 20th. plaster. NB. north door enclosure" Notes from resurvey 06.99 say "extensive patch survival possible". Resurvey likely to be accurate version.
Mapperton All. Saints	ps	ps	ps	y	18th and 19th overskim. "lost west tower".
Melbury Osmond St. Osmond	ps	n	n	ps	18th nave. possible 19th overskim on west wall of nave.
Milton Abbas Abbey	y	n	n	y	very small scale survival behind monuments.
Mosterton	ps	n	ps	y	possible small area in base of tower under 19th overskim. substantial reuse of med. stone in chancel arch. possible overskim on east wall of nave.
Nether Compton St. Nicholas	ps	ps	ps	ps	20th overskim to north chapel. much hollow sounding plaster. "Gundry like feel"
Osmington St. Osmund	ps	ps	ps	ps	19th plaster throughout. possible overskim thought unlikely at time of survey.
Over Compton St. Michael	ps	n	ps	ps	possible overskim in north chapel "beautified in 1822" and also behind wainscot in nave.
Owermoigne St. Michael	ps	ps	ps	ps	slight possibility of survival under 19th overskim on tower arch. unlikely elsewhere.

12.18 : Overskim, definite and possible, transcript of field notes, continued.

Pamphill St. Margaret and St. Andrew	ps	ps	ps	ps	locked. survey through windows. Ps. 19th 20th overskim
Piddlehinton St. Mary	ps	n	ps	y	wavy plaster on south of nave. 19th overskim in tower. evidence of general 'light touch' (eg rafters in south aisle).
Pilsdon St. Mary	y	y		y	?19th lath and plaster covering to medieval surfaces. seems to have been done to true up outward leaning walls. discovered during repairs to fire damage in 1999.functions as private chapel to adjacent religious community
Portesham St. Peter	ps	ps	n	ps	possible 19th overskim
Powerstock St. Mary	ps	n	ps	ps	19th painted plaster in nave, possible an overskim. med. plaster possible on north wall of porch.
Preston St. Andrew	ps	ps	ps	ps	thick 19th plaster throughout.
Puddletown St. Mary	y	ps	ps	ps	probably partial survival on most surfaces.
Pulham St. Thomas Becket	ps	ps	ps	ps	severe subsidence damage to western chancel.
Puncknowle St. Mary	y	y	y	ps	old plaster on all surfaces in chancel. Med. painting on nave side of chancel arch. poss. old plaster on north side of nave and on tower walls.
Radipole St. Ann	ps	ps	ps	ps	med. plaster in reveal of east window of north transept. thick overskim throughout.
Rhyme Intrinseca St. Hippolyte	ps	ps		ps	locked. appears to have thick 19th overskim. (churchwarden 01935 872056)
Shapwick St. Bartholomew	ps	ps	y	y	original survey :"poss under 19th in north aisle(priory chapel). re-survey after find of blocked and skimmed over niches in east wall of north aisle. niches contain original painted plaster.
Silton	ps	ps	ps	ps	all 19th plaster with stencil decoration. (Wyndham monument). poss in chantry. (notes rather confused).
South Perrott St. Mary	ps	ps	ps	ps	very thick early 20th overskim. leaning tower.
Spetisbury St. John Baptist	n	n	ps	ps (	survey by Gilly and jane.
Steeple St. Michael	ps	ps	ps	ps	limited survey in poor light.
Studland St Nicholas	y	ps	ps	ps	small patches on nave north wall and above nave/tower arch. possible, but only just, overskim on tower and chancel vault. Nave plaster stripped 20th.
Swyre Holy Trinity	ps	ps		ps	late med. plaster ceiling to chancel. possible 19th overskim in nave.
Sydling St. Nicholas St. Nicholas	ps	ps		ps	much patching and skimming, but definite poss of old plaster. re-survey by A and G left them less sure. (porch fireplace).
Symondsbury St. John Baptist	ps	ps	ps	ps	mostly stripped, but 19th overskim survives to dado level in nave, possibly behind reused box pew paneling in chancel and in door to tower stairs.
Tarrant Crawford St. Mary	y	y	y	y	med. plaster throughout, much with mural painting. some 19th overskim.
Tarrant Rawston St. Mary	ps	ps	ps	ps	private church. possible 1980's or 1990's overskim.
Toller Porcorum St. Peter and St. Andrew	n	ps	n	ps	all 20th scrape. possible overskim in chancel.
Trent St. Andrew	n	ps	n	ps	North chapel-19th overskim. (very fine, and odd, plaster tile (gypsum)dado in chancel. good rood screen, bench ends and glass).
Turners Puddle Holy Trinity	ps	ps	ps	ps	locked. survey through windows. all plaster appears 19th but may be overskim.
Upwey St. Laurence	y	n	y	y	chancel 19th, rest all old plaster with 19th overskim. exposed wall paintings in north nave and north aisle.

12.18 : Overskim, definite and possible, transcript of field notes, continued.

Wareham St. Mary	n	ps	y	y	slight possibility in chancel. possible in crypt. extensive survival in tower base under 19th overskim. (lead font. beautiful cast iron central heating).
Wareham St. Martin	y	y	y	y	extensive multi period plaster and mural paintings. medieval overskims.
Warmwell Holy Trinity	y	n		y	extensive med. plaster in nave with 19th overskim. good example of poor survey and dating by Pevsner.
West Chelborough St. Andrew	ps	ps	ps	y	poss under 19th overskim (remains of box pews, reused niche in north wall, inscription : see rear of field survey sheet. Pre-restoration photo in church).
West Knighton	y	ps	y	ps	med. plaster at high level in nave. Possible overskim in chancel. med. plaster in tower.
West Stafford St. Andrew	y	ps	ps	ps	fragments of late med. plaster in nave. Possible 19th overskim in chancel, especially around monuments.
Whitchurch Canonicorum Sts.Candida/Wite	ps	ps	ps	y	19th overskim on all surfaces. (pilgrimage shrine, extraordinary recent multi coloured mortar repairs to the floor).
Wimborne Minster St Cuthburga	ps	ps	ps	y	19th overskim throughout. exposed med. plaster with painting in north transept. likely large scale plaster survival behind monuments.
Winfrith Newburgh St. Christopher	y	y	y	y	19th overskim on north wall of chancel (med. plaster visible where patches have been lost at low level) and probably on north wall of nave. outstanding prospect for further survey.
Winterborne Came St. Peter. Perp	ps	ps		ps	very thick 19th overskim.
Winterborne Monkton St. Michael and St Jo	ps	ps	ps	ps	19th overskim throughout, but especially likely at west end of south aisle
Winterborne St. Martin St Martin	y	y	ps	ps	very thick 19th overskim.
Winterborne Whitechurch St. Mary	n	ps	ps	ps	possible overskim in chancel, crossing and south transept.
Winterbourne Steepleton St. Michael	y	ps	ps	ps	medieval plaster in nave with part exposed wall painting. Possible overskim in the chancel. no access to tower base.
Wool Holy Rood	ps	n	ps	ps	poss in tower.
Wootton Fitzpaine Church	ps	ps	y	y	patches of old plaster in crossing tower, rest 19th overskim. (being painted with Rose of Jericho distemper at time of visit).
Worth Matravers St. Nicholas	ps	ps	ps	ps	all 19th plaster but possible overskim.
Wraxall St. Mary	ps	ps	ps	ps	possible early plaster under 19th or 20th overskim.

12.18 : Overskim, definite and possible, transcript of field notes, continued.

All churches by restoration date

Source : Pevsner, RCHM, DNHAS and local newspapers

Key : x = no evidence : n = no old plaster : ps = possible old plaster : y = definite old plaster

Church	Plaster survival			Achitect	Restoration date
	nave	chancel	other		
Lytchett Matravers, St Mary	x	x	x	x	1505
Oborne, Old Church	y	y	x	x	1533
Manston, St Nicholas	x	x	x	x	1534
Iwerne Courtney (Shroton), St Mary	ps	ps	ps	Freke	1610
Minterne Magna, St Andrew	n	n	n	x	1610
Leweston, Holy Trinity	x	x	x	Fitzjames	1616
Folke, St Lawrence	x	x	x	Farrall	1628
Stockwood, St Edwold	ps	x	x	x	1638
West Chelborough, St Andrew	ps	ps	ps	x	1638
Puncknowle, St Mary	y	y	y	Houghton-Spencer	1660
Frampton, St Mary	n	n	n	x	1695
Charlton Marshall, St Mary	x	x	x	Bastards	1713
Winterborne Stickland, St Mary	y	y	y	x	1716
Horton, St Wolfreda	x	x	x	Chapman	1722
Seaborough, St John	x	x	x	Crickmay	1729
Wimborne St Giles, St Giles	n	n	n	Bodley, Comper	1732
Blandford Forum, St Peter and St Paul	n	n	n	Bastards, Hunt	1733
Fifehead Neville, All Saints	x	x	x	x	1736
Melbury Osmond, St Osmond	ps	n	n	Blomfield	1745
Creech Grange, St John Evangelist	x	x	x	Bond	1746
Fifehead Magdalen, St Mary Magdalene	n	n	n	x	1750
Portland, Easton, St George	n	n	n	Gilbert	1754
Charborough, St Mary	x	x	x	x	1775
Over Compton, St Michael	ps	n	ps	Goodden, Goodden	1776
Moreton, St Nicholas	x	x	x	Frampton	1776
Milton Abbas, St James	n	n	n	James Wyatt, Fletcher	1786
Milton Abbas, Abbey	y	n	n	Wyatt, Middleton, Scott	1789
Almer, St Mary	x	x	x	Bastards	1800
Weymouth, St Mary	x	x	x	Hamilton	1815
Pentridge, St Rumbold	n	n	n	Slater	1815
Broadwey, St Nicholas	x	x	x	Crickmay and son	1815
Symondsbury, St John Baptist	ps	ps	ps	x	1818
Poole, St James	x	x	x	Kent and Hannaford	1820
Sturminster Newton, St Mary	x	x	x	Evans	1825
Bridport, St Swithun	x	x	x	Wallis	1826
Fleet, Holy Trinity	n	n	n	Strickland	1827
Langton Herring, St Peter	y	ps	y	x	1827
East Stoke, St Mary	x	x	x	Owen, Colson and Son	1828
Pilsdon, St Mary	y	y	x	x	1830
Kingston, Old Church	x	x	x	Repton	1833
Lytchett Minster, [? Dedication]	x	x	x	Tulloch	1833
Mosterton, St Mary	ps	n	ps	Pearce	1833
Witchampton, St Mary and St Cuthberga	n	n	n	x	1833
Poole, (Parkstone), St Peter	x	x	x	Tulloch, Rogers, Pearson	1833

12.19 : All churches by restoration date.

Poole, (Longfleet), St Mary	x	x	x	x	1833
Church Knowle, St Peter	ps	ps	ps	x	1833
Chickerell, St Mary	ps	ps	n	x	1834
Holt, St James	x	x	x	Tulloch, T.H. Wyatt	1834
Weymouth, Holy Trinity	x	x	x	Bury, Crickmay and Son	1834
Charmouth, St Andrew	n	n	n	Fowler	1836
East Burton, [? dedication]	x	x	x	Parkinson	1836
Boveridge, St Aldhelm	x	x	x	x	1838
Charminster, St Mary	y	ps	x	x	1838
Lydlinch, St Thomas Becket	x	x	x	x	1838
Upwey, St Laurence	y	n	y	x	1,838
Gillingham, St Mary	n	ps	n	Ponting and Caroe	1838
Blackdown, Holy Trinity	x	x	x	Bracebridge	1839
Compton Valence, St Thomas of Canterbury	n	n	n	Ferrey	1839
Portland, Fortuneswell, St John Baptist	x	x	x	Monday (Wallace), Crickmay	1839
Shaftesbury (Cann), St Rumbold	x	x	x	Walker	1840
Trent, St Andrew	n	ps	n	Rev. William Henry Turner	1840
West Stour, St Mary	ps	ps	n	x	1840
Winterborne Clenston, St Nicholas	n	n	n	Louis Vulliamy	1840
Hooke, St Giles	ps	ps	ps	Crickmay	1840
Chedington, St James	x	x	x	Carver, Vialls	1,840
Leigh, St Andrew	ps	ps	n	Withers	1840
Corfe Mullen, St Hubert	ps	ps	ps	x	1841
Morcombelake, St Gabriel	n	n	n	T.H. Wyatt and Brandon	1841
Wareham, St Mary	n	ps	y	Donaldson	1841
Marshwood, St Mary	n	n	n	Vialls	1841
Shaftesbury, Holy Trinity	x	x	x	Scott, Doran Webb	1841
East Stour, Christ Church	n	n	n	Alexander	1842
Wynford Eagle, St Lawrence	n	n	n	Osborn	1842
Dorchester, All Saints	x	x	x	Ferrey	1843
Enmore Green, St John Evangelist	x	x	x	Alexander	1843
Swyre, Holy Trinity	ps	ps	x	x	1843
Tarrant Gunville, St Mary	n	n	n	T.H. Wyatt	1844
Winterborne Whitechurch, St Mary	n	ps	ps	Ferrey	1844
Halstock, St Mary	ps	n	n	Pugin	1845
Melplash, Christ Church	n	n	n	Ferrey	1845
Bradpole, Holy Trinity	x	x	x	Ponting	1845
Hinton St Mary, St Peter	x	x	x	Oborne	1846
Motcombe, St Mary	n	n	ps	Alexander	1846
Osmington, St Osmund	ps	ps	ps	Ferrey	1846
Durweston, St Nicholas	n	n	n	Hardwick	1847
Sutton Waldron, St Bartholomew	n	n	n	Alexander	1847
Rampisham, St Michael	ps	ps	ps	Pugin, Hicks	1847
Monkton Wyld, St Andrew	n	n	n	Carpenter	1848
Plush, St John Baptist	x	x	x	Ferrey	1848
Hilfield, St Nicholas	y	n	x	Withers	1848
Alderholt, St James	x	x	x	Prior	1849
Beaminster, Holy Trinity	x	x	x	Carver and Giles	1849
Bradford Peverell, St Mary	x	x	x	Burton	1849
Chettle, St Mary	x	x	x	Morris and Henson	1849
Tincleton, St John Evangelist	n	n	n	Ferrey	1849
Little Bredy, St Michael	n	n	n	Ferrey	1850
Weymouth, St John	x	x	x	Bury	1850
Child Okeford, St Nicholas	n	n	n	T.H. Wyatt, T.H. Wyatt, Whip	1850
More Crichel, St Mary	x	x	x	Alexander	1850
Sherborne, Abbey	n	n	n	Slater and Carpenter	1850

12.19 : All churches by restoration date, continued.

Melbury Abbas, St Thomas	x	x	x	Evans	1851
Chilfrome, Holy Trinity	n	n	n	x	1852
Long Crichel, St Mary	n	n	ps	x	1852
Marnhull, St Gregory	x	x	x	x	1852
Tarrant Keyneston, All Saints	n	n	n	T.H. Wyatt	1852
Tyneham, St Mary	x	x	x	Bond, Ferrey, Ferrey	1852
Evershot, St Osmund	n	n	n	Shout, Shout	1852
Piddletrenthide, All Saints	x	x	x	Hicks, Christian	1852
Brownsea Island, St Mary	n	n	n	x	1853
Fishpond, St John Baptist	n	n	n	x	1854
Powerstock, St Mary	ps	n	ps	Hicks	1854
Winfrith Newburgh, St Christopher	y	y	y	x	1854
Holnest, St Mary	x	x	x	x	1855
Preston, St Andrew	ps	ps	ps	T.H. Wyatt	1855
Tolpuddle, St John Evangelist	n	n	n	T.H. Wyatt	1855
Caundle Marsh, St Peter and St Paul	x	x	x	Shout	1857
Woolland, [? Dedication]	x	x	x	Scott	1857
Cattistock, St Peter and St Paul	n	n	n	Scott, Scott jnr	1857
Wimborne Minster, St Cuthburga	ps	ps	ps	T.H. Wyatt, Pearson	1857
Askerswell, St Michael	ps	ps	ps	Bury	1858
Catherston Leweston, St Mary	x	x	x	Pearson	1858
Stourpaine, Holy Trinity	n	n	ps	T.H. Wyatt	1858
Chetnole, St Peter	n	n	n	Slater and Carpenter	1859
Corfe Castle, St Edward	ps	n	n	T.H. Wyatt	1859
Sturminster Marshall, St Mary	n	n	n	Woodyer	1859
Swanage, All Saints	n	n	n	T.H. Wyatt	1859
East Orchard, St Thomas	x	x	x	Evans and Pullman, Christian	1859
Bridport, St Mary	x	n	n (	Hicks	1860
Bridport, St Andrew	x	x	x	Bury	1860
Coombe Keynes, Holy Rood	n	n	n	Hicks	1860
Hinton Parva, St Kenelm	x	x	x	x	1860
Sherborne, St Mary Magdalene	x	x	x	Slater	1860
Gussage All Saints, All Saints	ps	ps	ps	Christian	1860
Athelhampton, St John	n	n	n	Hicks	1861
Kingston Magna, All Saints	n	n	n	Turner	1861
Langton Long (Blandford), All Saints	x	x	x	T.H. Wyatt	1861
Shipton Gorge, St Martin	x	x	x	Hicks	1861
Winterborne Houghton, St Andrew	n	n	n	T.H. Wyatt	1861
Woodsford, St John Evangelist	n	n	n	T.H. Wyatt	1861
Buckhorn Weston, St John Baptist	ps	ps	ps	Crickmay	1861
Bettiscombe, St Stephen	n	n	n	Hicks	1862
Fontmell Magna, St Andrew	x	x	x	Evans	1862
Long Bredy, St Peter	n	ps	ps	x	1862
North Poorton, St Mary Magdalene	n	n	n	Hicks	1862
Oborne, St Cuthbert	x	x	x	Slater	1862
Beaminster, St Mary	ps	ps	ps	White	1862
Poyntington, All Saints	x	x	x	x	1863
Walditch, St Mary	x	x	x	x	1863
Batcombe, St Mary	n	n	n	Hicks	1864
Bishops Caundle, St Peter and St Paul	x	x	x	Slater	1864
East Lulworth, St Andrew	x	x	x	Hicks	1864
Wool, Holy Rood	ps	n	ps	Hicks	1864
Broadmayne, St Martin	x	x	x	Hicks	1865
Broadoak, St Paul	x	x	x	Bury	1865
Eype, St Peter	n	n	n	Bury (Boulton carver)	1865
Okeford Fitzpaine, St Andrew	n	n	n	Hicks	1865

12.19 : All churches by restoration date, continued.

Winterborne Zelston, St Mary	x	x	x	T. H. Wyatt	1865
Compton Abbas, St Mary	n	n	n	Evans	1866
East Holme, St John Evangelist	x	x	x	Hicks	1866
Shaftesbury, St James	x	x	x	T.H. Wyatt	1866
Thornford, St Mary Magdalene	n	n	n	Slater and Carpenter	1866
Compton Abbas West, [? Dedication]	n	n	n	Hicks	1867
Drimpton, St Mary	x	x	x	Allen	1867
Piddlehinton, St Mary	ps	n	ps	Christian	1867
Stour Row, All Saints	x	x	x	Hicks	1867
Thorncombe, St Mary	x	x	x	Allen	1867
Broadwindsor, St John Baptist	ps	ps	ps	Allen	1868
Mappowder, St Peter and St Paul	x	x	x	Slater and Carpenter	1868
Milton on Stour, St Simon and St Jude	n	n	n	Slater and Carpenter	1868
Poxwell, St John Evangelist (pulled down)	x	x	x	Evans	1868
Poxwell, StJohn the Baptist	x	x	x	Evans	1868
Stalbridge, St Mary	x	x	x	Boucher, T.H. Wyatt	1868
Turnworth, St Mary	n	n	n	Crickmay	1869
West Lulworth, Holy Trinity	n	n	n	Hicks (supervised by Crickma	1869
West Milton, St Mary Magdalene	n	n	n	Crickmay ('worked with' Hans	1869
Swanage (Herston), St Mark	x	x	x	Hicks, Crickmay	1869
Bloxworth, St Andrew	x	x	x	Evans	1870
Buckland Newton, Holy Rood	x	x	x	T.H. Wyatt	1870
Hinton Martell, St John Evangelist	x	x	x	Crickmay	1870
Portland, Grove, St Peter	x	x	x	Du Cane	1870
Pulham, St Thomas Becket	ps	ps	ps	Hingeston-Randolph	1870
Sixpenny Handley, St Mary	n	n	n	Crickmay	1870
Toller Whelme, St John	n	n	n	Warr	1870
Upcerne, [? Dedication]	x	x	x	x	1870
Winterborne Monkton, St Michael (RCHM St S	ps	ps	ps	Christian	1870
Iwerne Minster, St Mary	ps	n	ps	T.H. Wyatt, Pearson	1870
Dewlish, All Saints	y	n	y (	T.H. Wyatt	1872
Kimmeridge, [? Dedication]	ps	ps	x	x	1872
Margaret Marsh, St Margaret	x	x	x	Crickmay	1872
Stoke Wake, All Saints	x	x	x	Crickmay	1872
Winterborne Kingston, St Nicholas	n	n	n	Street	1872
Wootton Fitzpaine, [? Dedication]	ps	ps	y	Birch	1872
Goathill, St Peter	x	x	x	x	1873
Kingston, St James	x	x	x	Street	1873
Longburton, St James	ps	ps	ps	Farrall	1873
Morden, St Mary	x	x	x	Seller	1873
Pimperne, St Peter	x	x	x	Green	1873
Ashmore, St Nicholas	n	n	n	Edwards	1874
Melbury Sampford, St Mary	x	x	x	x	1874
Tarrant Hinton, St Mary	n	n	n	Ferrey	1874
Alton Pancras, St Pancras	x	x	x	Christian, Crickmay	1874
Corscombe, St Mary	n	n	n	Allen	1875
Cranborne, St Mary And St Bartholomew.	y	ps	y	Brandon	1875
Dorchester, Holy Trinity	x	x	x	Ferrey	1875
Glanvilles Wooton, St Mary	x	x	x	Crickmay	1875
Canford Magna, [? Dedication]	n	n	n	Brandon	1876
Langton Matravers, St George	n	n	y (	Crickmay	1876
Milborne St Andrew, St Andrew	x	x	x	Street	1876
West Orchard, [? Dedication]	x	x	x	T.H. Wyatt	1876
Wimborne, Leigh, St John Evangelist	x	x	x	Fletcher	1876
Burstock, St Andrew	x	x	x	Peters	1877
Poole, (Branksome Park), All Saints	x	x	x	Burton and Stevens	1877

12.19 : All churches by restoration date, continued.

Stoke Abbott, St Mary	ps	ps	n	Aubyn	1877
Chaldon Herring, St Nicholas	n	n	n	Crickmay	1878
Portland, Southwell, St Andrew	x	x	x	Crickmay	1878
Bourton, St George	n	n	n	Christian, Ponting	1878
Spetisbury, St John Baptist	n	n	ps	T. H. Wyatt	1879
Todber, [? Dedication]	x	x	x	x	1879
Warmwell, Holy Trinity	y	n	x	Bennett	1881
Beer Hackett, St Michael	n	n	n	Crickmay, Ponting	1882
Chideock, St Giles	ps	n	ps	Crickmay	1883
Haydon, St Catherine	x	x	x	Carpenter	1883
North Wooton, St Mary Magdalene	x	x	x	Carpenter and Ingelow	1883
Owermoigne, St Michael	ps	ps	ps	Jackson	1883
Stock Gaylard, St Barnabas	x	x	x	Fletcher	1884
Hammoon, St Paul	x	x	x	x	1885
Holwell, St Lawrence	x	x	x	Crickmay	1885
Farnham, St Laurence	ps	n	n	x	1886
Bothenhampton, Holy Trinity	n	n	n	Prior	1887
Salway Ash, Holy Trinity	x	x	x	Crickmay	1887
Broadstone, St John Baptist	x	x	x	Fletcher	1888
Shillingstone, Holy Rood	ps	n	n	Hunt, Bodley	1888
Anderson, St Michael	x	x	x	x	1889
Poole, (Branksome), St Clement	x	x	x	Romaine-Walker and Tanner	1889
Stratton, St Mary	n	n	n	Crickmay and son	1891
Toller Porcorum, St Peter and St Andrew	n	ps	n	Taylor and Gordon	1891
Poole, (Branksome), St Aldhelm	x	x	x	Bodley and Garner	1892
Woodlands, Ascension	n	n	n	Bodley	1892
Colehill, St Michael	x	x	x	Caroe	1893
Verwood, St Michael	x	x	x	Adye and Adye	1893
Weymouth, St Paul	x	x	x	Fellowes Prynne	1893
West Knighton, St Peter	y	ps	y	Hicks (Hardy)	1894
Hampreston, All Saints	n	n	n	Romaine-Walker and Tanner	1896
Burton Bradstock, St Mary	ps	ps	ps	Prior	1897
West Moors, St Mary	x	x	x	Stanley	1897
Lytchett Heath, St Aldhelm	x	x	x	Crickmay and Son	1898
West Stafford, St Andrew	y	ps	ps	Ponting	1898
Kingston Lacy, St Stephen	n	n	n	Ponting	1906
Dorchester, Fordington, St George	x	x	y	Rev. Moule and Feacey	1906
Ibberton, St Eustace	n	n	n	Ponting	1907
South Perrott, St Mary	ps	ps	ps	Southcombe Parker	1907
Weymouth, St Martin	x	x	x	Ponting	1908
Dorchester, St Mary	x	x	x	Ponting	1910
Puddletown, St Mary	y	ps	ps	Ponting	1910
Whitcombe, [? Dedication]	y	y	y	x	1912
Winterborne Tomson, St Andrew	y	y	y	Powys	1931
Hamworthy, St Michael	n	n	n	Morley and Bolden	1958
Cerne Abbas, St Mary	y	ps	ps	T.H. Wyatt	1960
Abbotsbury, Abbey	n	n	n	x	x
Abbotsbury, St Nicholas	y	y	y	x	x
Abbotsbury, St Catherine's Chapel.	n	n	n	x	x
Affpuddle, St Laurence	ps	ps	n	T.H. Wyatt	x
Arne, St Nicholas	ps	ps	x	x	x
Belchalwell, St Aldhelm	ps	n	n	x	x
Bere Regis, St John Baptist	x	x	x	Street	x
Bincombe, Holy Trinity	ps	ps	x	x	x
Bindon Abbey, ruin	x	x	x	x	x
Baindford Forum, St Leonard's Chapel	x	x	x	x	x

12.19 : All churches by restoration date, continued.

Blandford St Mary, St Mary	n	ps	n	Pitt	x
Bothenhampton, Old Church	ps	ps	x	x	x
Bradford Abbas, St Mary	n	n	n	x	x
Buckland Ripers, St Nicholas	n	n	n	x	x
Burleston, [? Dedication] ruin	n	y	ps	x	x
Burton	x	x	x	x	x
Chalbury, All Saints	ps	ps	n	x	x
Cheselbourne, St Martin	ps	ps	ps	x	x
Chilcombe, [? Dedication]	x	x	x	x	x
Compton Abbas, Old Church (ruin)	n	n	y	x	x
Dorchester, St Peter	n	n	n	Hicks	x
Edmondsham, St Nicholas	ps	ps	ps	x	x
Farrington, St Peter	x	x	x	x	x
Fleet, Old Church	n	ps	n	x	x
Forde Abbey	x	x	x	Chard	x
Frome St Quintin, St Quintin	n	ps	n	x	x
Frome Vauchurch, [? Dedication]	ps	ps	n	x	x
Godmanstone, Holy Trinity	ps	ps	ps	x	x
Gussage St Andrew, St Andrew	y	ps	ps	x	x
Gussage St Michael, St Michael	ps	ps	ps	Street	x
Hanford, St Michael and all Angels	x	x	x	x	x
Hazelbury Bryan, St Mary and St James	x	x	x	x	x
Hermitage, St Mary	x	x	x	x	x
Hilton, All Saints	x	x	x	x	x
Iwerne Stepleton, St Mary	x	x	x	x	x
Knowlton (inside circles), ruin	y	y	y (	x	x
Lewcombe, St James	x	x	x	x	x
Lillington, St Martin	ps	ps	ps	Withers	x
Litton Cheyney, St Mary	ps	ps	y (	x	x
Loders, St Mary Magdalene	y	ps	ps	x	x
Lyme Regis, St Michael	ps	ps	n	x	x
Lyscombe, ruin	x	x	x	x	x
Maiden Newton, St Mary	ps	ps	ps	x	x
Mapperton, All Saints	ps	ps	ps	x	x
Melbury Bubb, St Mary	n	n	n	Withers	x
Melcombe Horsey, St Andrew	x	x	x	x	x
Milton Abbas, St catherine's chapel	x	x	x	x	x
Netherbury, St Mary	ps	ps	x	x	x
Nether Cerne, All Saints	ps	ps	ps	x	x
Nether Compton, St Nicholas	ps	ps	ps	x	x
North Wooton, Old Church (ruin)	x	x	x	x	x
Pamphill, St Margaret and St Andrew	ps	ps	ps	x	x
Portesham, St Peter	ps	ps	n	x	x
Portesham, (Corton), St Bartholomew	x	x	x	x	x
Portland, Easton, St Andrew, (ruin)	n	n	n	Merrick	x
Purse Caundle, St Peter	x	x	x	x	x
Radipole, St Ann	ps	ps	ps	x	x
Ryme Intrinseca, St Hippolyte	ps	ps	x	x	x
St Aldhelm's Head, St Aldhelm's Chapel	n	n	n	x	x
Sandford Orcas, St Nicholas	x	x	x	x	x
Shaftesbury, St Peter	n	n	n	x	x
Shapwick, St Bartholomew	ps	ps	y	Rogers	x
Silton, St Nicholas	ps	ps	ps	x	x
Stanton St Gabriel, Old Church, ruin	n	n	n	x	x
Steeple, St Michael	ps	ps	ps	x	x
Stinsford, St Michael	y	ps	ps	x	x

12.19 : All churches by restoration date, continued.

Stour Provost, St Michael	ps	y (	n	x	x
Stourton Caundle, St Peter	x	x	x	x	x
Studland, St Nicholas	y	ps	ps	x	x
Sydling St Nicholas, St Nicholas	ps	ps	x	x	x
Tarrant Crawford, St Mary	y	y	y	x	x
Tarrant Monkton, All Saints	ps	ps	x	x	x
Tarrant Rawston, St Mary	ps	ps	ps	x	x
Tarrant Rushton, St Mary	n	n	n	x	x
Toller Fratum, St Basil	n	n	n	x	x
Turners Puddle, Holy Trinity	ps	ps	ps	x	x
Wareham, St Martin	y	y	y	x	x
Wareham, Holy Trinity	n	n	n	x	x
West Milton, Old Church	n	n	n	x	x
West Moors, St John	x	x	x	x	x
West Parley, All Saints	n	n	n	x	x
Whitchurch Canonicorum, St Candida St Wite	ps	ps	ps	x	x
Winterborne Came, St Peter	ps	ps	x	x	x
Winterborne St Martin, St Martin	y	y	ps	x	x
Winterbourne Abbas, St Mary	n	n	ps	x	x
Winterbourne Steepleton, St Michael	y	ps	ps	x	x
Worth Matravers, St Nicholas	ps	ps	ps	x	x
Wraxall, St Mary	ps	ps	ps	x	x
Wyke Regis, All Saints	x	x	x	x	x
Yetminster, St Andrew	n	ps	n	x	x

12.19 : All churches by restoration date, continued.

Old plaster (certain and possible) by restoration date

Source : Pevsner, RCHM, DNHAS and local newspapers

Key : x = no evidence : n = no old plaster : ps = possible old plaster : y = definite old plaster

Church	Plaster survival			Achitect	Restoration date
	nave	chancel	other		
Oborne, Old Church	y	y	x	x	1533
Iwerne Courtney (Shroton), St Mary	ps	ps	ps	Freke	1610
Stockwood, St Edwold	ps	x	x	x	1638
West Chelborough, St Andrew	ps	ps	ps	x	1638
Puncknowle, St Mary	y	y	y	Houghton-Spencer	1660
Winterborne Stickland, St Mary	y	y	y	x	1716
Melbury Osmond, St Osmond	ps	n	n	Blomfield	1745
Over Compton, St Michael	ps	n	ps	Goodden, Goodden	1776
Milton Abbas, Abbey	y	n	n	Wyatt, Middleton, Scott	1789
Symondsbury, St John Baptist	ps	ps	ps	x	1818
Langton Herring, St Peter	y	ps	y	x	1827
Pilsdon, St Mary	y	y	x	x	1830
Mosterton, St Mary	ps	n	ps	Pearce	1833
Church Knowle, St Peter	ps	ps	ps	x	1833
Chickerell, St Mary	ps	ps	n	x	1834
Charminster, St Mary	y	ps	x	x	1838
Upwey, St Laurence	y	n	y	x	1838
Gillingham, St Mary	n	ps	n	Ponting and Caroe	1838
Trent, St Andrew	n	ps	n	Rev. William Henry Turner	1840
West Stour, St Mary	ps	ps	n	x	1840
Hooke, St Giles	ps	ps	ps	Crickmay	1840
Leigh, St Andrew	ps	ps	n	Withers	1840
Corfe Mullen, St Hubert	ps	ps	ps	x	1841
Wareham, St Mary	n	ps	y	Donaldson	1841
Swyre, Holy Trinity	ps	ps	x	x	1843
Winterborne Whitechurch, St Mary	n	ps	ps	Ferrey	1844
Halstock, St Mary	ps	n	n	Pugin	1845
Motcombe, St Mary	n	n	ps	Alexander	1846
Osmington, St Osmund	ps	ps	ps	Ferrey	1846
Rampisham, St Michael	ps	ps	ps	Pugin, Hicks	1847
Hilfield, St Nicholas	y	n	x	Withers	1848
Long Crichel, St Mary	n	n	ps	x	1852
Powerstock, St Mary	ps	n	ps	Hicks	1854
Winfrith Newburgh, St Christopher	y	y	y	x	1854
Preston, St Andrew	ps	ps	ps	T.H. Wyatt	1855
Wimborne Minster, St Cuthburga	ps	ps	ps	T.H. Wyatt, Pearson	1857
Askerswell, St Michael	ps	ps	ps	Bury	1858
Stourpaine, Holy Trinity	n	n	ps	T.H. Wyatt	1858
Corfe Castle, St Edward	ps	n	n	T.H. Wyatt	1859
Gussage All Saints, All Saints	ps	ps	ps	Christian	1860
Buckhorn Weston, St John Baptist	ps	ps	ps	Crickmay	1861
Long Bredy, St Peter	n	ps	ps	x	1862
Beaminster, St Mary	ps	ps	ps	White	1862
Wool, Holy Rood	ps	n	ps	Hicks	1864
Piddlehinton, St Mary	ps	n	ps	Christian	1867

12.20 : Old plaster, certain and possible, by restoration date.

Broadwindsor, St John Baptist	ps	ps	ps	Allen	1868
Pulham, St Thomas Becket	ps	ps	ps	Hingeston-Randolph	1870
Winterborne Monkton, St Michael (RCHM St Simon) and	ps	ps	ps	Christian	1870
Iwerne Minster, St Mary	ps	n	ps	T.H. Wyatt, Pearson	1870
Dewlish, All Saints	y	n	y	T.H. Wyatt	1872
Kimmeridge, [? Dedication]	ps	ps	x	x	1872
Wootton Fitzpaine, [? Dedication]	ps	ps	y	Birch	1872
Longburton, St James	ps	ps	ps	Farrall	1873
Cranborne, St Mary And St Bartholomew.	y	ps	y	Brandon	1875
Langton Matravers, St George	n	n	y	Crickmay	1876
Stoke Abbott, St Mary	ps	ps	n	Aubyn	1877
Spetisbury, St John Baptist	n	n	y	T. H. Wyatt	1879
Warmwell, Holy Trinity	y	n	x	Bennett	1881
Chideock, St Giles	ps	n	ps	Crickmay	1883
Owermoigne, St Michael	ps	ps	ps	Jackson	1883
Farnham, St Laurence	ps	n	n	x	1886
Shillingstone, Holy Rood	ps	n	n	Hunt, Bodley	1888
Toller Porcorum, St Peter and St Andrew	n	ps	n	Taylor and Gordon	1891
West Knighton, St Peter	y	ps	y	Hicks (Hardy)	1894
Burton Bradstock, St Mary	ps	ps	ps	Prior	1897
West Stafford, St Andrew	y	ps	ps	Ponting	1898
Dorchester, Fordington, St George	x	x	y	Rev. Moule and Feacey	1906
South Perrott, St Mary	ps	ps	ps	Southcombe Parker	1907
Puddletown, St Mary	y	ps	ps	Ponting	1910
Whitcombe, [? Dedication]	y	y	y	x	1912
Winterborne Tomson, St Andrew	y	y	y	Powys	1931
Cerne Abbas, St Mary	y	ps	ps	T.H. Wyatt	1960
Abbotsbury, St Nicholas	y	y	y	x	x
Affpuddle, St Laurence	ps	ps	n	T.H. Wyatt	x
Arne, St Nicholas	ps	ps	x	x	x
Belchalwell, St Aldhelm	ps	n	n	x	x
Bincombe, Holy Trinity	ps	ps	x	x	x
Blandford St Mary, St Mary	n	ps	n	Pitt	x
Bothenhampton, Old Church	ps	ps	x	x	x
Burleston, [? Dedication] ruin	n	y	ps	x	x
Chalbury, All Saints	ps	ps	n	x	x
Cheselbourne, St Martin	ps	ps	ps	x	x
Compton Abbas, Old Church (ruin)	n	n	y	x	x
Dorchester, St Peter	n	n	n	Hicks	x
Edmondsham, St Nicholas	ps	ps	ps	x	x
Fleet, Old Church	n	ps	n	x	x
Frome St Quintin, St Quintin	n	ps	n	x	x
Frome Vauchurch, [? Dedication]	ps	ps	n	x	x
Godmanstone, Holy Trinity	ps	ps	ps	x	x
Gussage St Andrew, St Andrew	y	ps	ps	x	x
Gussage St Michael, St Michael	ps	ps	ps	Street	x
Knowlton (inside circles), ruin	y	y	y	x	x
Lillington, St Martin	ps	ps	ps	Withers	x
Litton Cheyney, St Mary	ps	ps	y	x	x
Loders, St Mary Magdalene	y	ps	ps	x	x
Lyme Regis, St Michael	ps	ps	n	x	x
Maiden Newton, St Mary	ps	ps	ps	x	x
Mapperton, All Saints	ps	ps	ps	x	x
Netherbury, St Mary	ps	ps	x	x	x
Nether Cerne, All Saints	ps	ps	ps	x	x
Nether Compton, St Nicholas	ps	ps	ps	x	x

12.20 : Old plaster, certain and possible, by restoration date, continued.

Pamphill, St Margaret and St Andrew	ps	ps	ps	x	x
Portesham, St Peter	ps	ps	n	x	x
Radipole, St Ann	ps	ps	ps	x	x
Ryme Intrinseca, St Hippolyte	ps	ps	x	x	x
Shapwick, St Bartholomew	ps	ps	y	Rogers	x
Silton, St Nicholas	ps	ps	ps	x	x
Steeple, St Michael	ps	ps	ps	x	x
Stinsford, St Michael	y	ps	ps	x	x
Stour Provost, St Michael	ps	y	n	x	x
Studland, St Nicholas	y	ps	ps	x	x
Sydling St Nicholas, St Nicholas	ps	ps	x	x	x
Tarrant Crawford, St Mary	y	y	y	x	x
Tarrant Monkton, All Saints	ps	ps	x	x	x
Tarrant Rawston, St Mary	ps	ps	ps	x	x
Turners Puddle, Holy Trinity	ps	ps	ps	x	x
Wareham, St Martin	y	y	y	x	x
Whitchurch Canonicorum, St Candida St Wite	ps	ps	ps	x	x
Winterborne Came, St Peter	ps	ps	x	x	x
Winterborne St Martin, St Martin	y	y	ps	x	x
Winterbourne Abbas, St Mary	n	n	ps	x	x
Winterbourne Steepleton, St Michael	y	ps	ps	x	x
Worth Matravers, St Nicholas	ps	ps	ps	x	x
Wraxall, St Mary	ps	ps	ps	x	x
Yetminster, St Andrew	n	ps	n	x	x

12.20 : Old plaster, certain and possible, by restoration date, continued.

Old plaster (certain) by restoration date

Source : Pevsner, RCHM, DNHAS and local newspapers

Key : x = no evidence : n = no old plaster : ps = possible old plaster : y = definite old plaster

Church	Plaster survival			Achitect	Restoration date
	nave	chancel	other		
Oborne, Old Church	y	y	x	x	1533
Puncknowle, St Mary	y	y	y	Houghton-Spencer	1660
Winterborne Stickland, St Mary	y	y	y	x	1716
Milton Abbas, Abbey	y	n	n	Wyatt, Middleton, Scott	1789
Langton Herring, St Peter	y	ps	y	x	1827
Pilsdon, St Mary	y	y	x	x	1830
Charminster, St Mary	y	ps	x	x	1838
Upwey, St Laurence	y	n	y	x	1838
Wareham, St Mary	n	ps	y	Donaldson	1841
Hilfield, St Nicholas	y	n	x	Withers	1848
Winfrith Newburgh, St Christopher	y	y	y	x	1854
Dewlish, All Saints	y	n	y	T.H. Wyatt	1872
Wootton Fitzpaine, [? Dedication]	ps	ps	y	Birch	1872
Cranborne, St Mary And St Bartholomew.	y	ps	y	Brandon	1875
Langton Matravers, St George	n	n	y	Crickmay	1876
Warmwell, Holy Trinity	y	n	x	Bennett	1881
West Knighton, St Peter	y	ps	y	Hicks (Hardy)	1894
West Stafford, St Andrew	y	ps	ps	Ponting	1898
Dorchester, Fordington, St George	x	x	y	Rev. Moule and Feacey	1906
Puddletown, St Mary	y	ps	ps	Ponting	1910
Whitcombe, [? Dedication]	y	y	y	x	1912
Winterborne Tomson, St Andrew	y	y	y	Powys	1931
Cerne Abbas, St Mary	y	ps	ps	T.H. Wyatt	1960
Abbotsbury, St Nicholas	y	y	y	x	x
Burleston, [? Dedication] ruin	n	y	ps	x	x
Compton Abbas, Old Church (ruin)	n	n	y	x	x
Gussage St Andrew, St Andrew	y	ps	ps	x	x
Knowlton (inside circles), ruin	y	y	y	x	x
Litton Cheyney, St Mary	ps	ps	y	x	x
Loders, St Mary Magdalene	y	ps	ps	x	x
Shapwick, St Bartholomew	ps	ps	y	Rogers	x
Stinsford, St Michael	y	ps	ps	x	x
Stour Provost, St Michael	ps	y	n	x	x
Studland, St Nicholas	y	ps	ps	x	x
Tarrant Crawford, St Mary	y	y	y	x	x
Wareham, St Martin	y	y	y	x	x
Winterborne St Martin, St Martin	y	y	ps	x	x
Winterbourne Steepleton, St Michael	y	ps	ps	x	x

12.21 : Old plaster, certain, by restoration date.

Surveyed churches by restoration date

Source : Pevsner, RCHM, DNHAS and local newspapers

Key : x = no evidence : n = no old plaster : ps = possible old plaster : y = definite old plaster

Church	Plaster survival			Achitect	Restoration date
	nave	chancel	other		
Oborne, Old Church	y	y	x	x	1533
Iwerne Courtney (Shroton), St Mary	ps	ps	ps	Freke	1610
Minterne Magna, St Andrew	n	n	n	x	1610
Stockwood, St Edwold	ps	x	x	x	1638
West Chelborough, St Andrew	ps	ps	ps	x	1638
Puncknowle, St Mary	y	y	y	Houghton-Spencer	1660
Frampton, St Mary	n	n	n	x	1695
Winterborne Stickland, St Mary	y	y	y	x	1716
Wimborne St Giles, St Giles	n	n	n	Bodley, Comper	1732
Blandford Forum, St Peter and St Paul	n	n	n	Bastards, Hunt	1733
Melbury Osmond, St Osmond	ps	n	n	Blomfield	1745
Fifehead Magdalen, St Mary Magdalene	n	n	n	x	1750
Portland, Easton, St George	n	n	n	Gilbert	1754
Over Compton, St Michael	ps	n	ps (nc	Goodden, Goodden	1776
Milton Abbas, St James	n	n	n	James Wyatt, Fletcher	1786
Milton Abbas, Abbey	y	n	n	Wyatt, Middleton, Scott	1789
Pentridge, St Rumbold	n	n	n	Slater	1815
Symondsbury, St John Baptist	ps	ps	ps	x	1818
Fleet, Holy Trinity	n	n	n	Strickland	1827
Langton Herring, St Peter	y	ps	y	x	1827
Pilsdon, St Mary	y	y	x	x	1830
Mosterton, St Mary	ps	n	ps	Pearce	1833
Witchampton, St Mary and St Cuthberga	n	n	n	x	1833
Church Knowle, St Peter	pr	pr	ps	x	1833
Chickerell, St Mary	ps	ps	n	x	1834
Charmouth, St Andrew	n	n	n	Fowler	1836
Charminster, St Mary	y	ps	x	x	1838
Upwey, St Laurence	y	n	y	x	1838
Gillingham, St Mary	n	ps (s	n	Ponting and Caroe	1838
Compton Valence, St Thomas of Canterbury	n	n	n	Ferrey	1839
Trent, St Andrew	n	ps	n	Rev. William Henry Turner	1840
West Stour, St Mary	ps	pr	n	x	1840
Winterborne Clenston, St Nicholas	n	n	n	Louis Vulliamy	1840
Hooke, St Giles	ps	ps	ps	Crickmay	1840
Leigh, St Andrew	ps	ps	n	Withers	1840
Corfe Mullen, St Hubert	ps	ps	ps	x	1841
Morcombelake, St Gabriel	n	n	n	T.H. Wyatt and Brandon	1841
Wareham, St Mary	n	ps	y	Donaldson	1841
Marshwood, St Mary	n	n	n	Vialls	1841
East Stour, Christ Church	n	n	n	Alexander	1842
Wynford Eagle, St Lawrence	n	n	n	Osborn	1842
Swyre, Holy Trinity	ps	ps	x	x	1843
Tarrant Gunville, St Mary	n	n	n	T.H. Wyatt	1844
Winterborne Whitechurch, St Mary	n	ps	ps	Ferrey	1844

12.22 : Surveyed churches by restoration date.

Halstock, St Mary	ps	n	n	Pugin	1845
Melplash, Christ Church	n	n	n	Ferrey	1845
Motcombe, St Mary	n	n	ps (ni	Alexander	1846
Osmington, St Osmund	ps	ps	ps	Ferrey	1846
Durweston, St Nicholas	n	n	n	Hardwick	1847
Sutton Waldron, St Bartholomew	n	n	n	Alexander	1847
Rampisham, St Michael	ps	ps	ps	Pugin, Hicks	1847
Monkton Wyld, St Andrew	n	n	n	Carpenter	1848
Hilfield, St Nicholas	y	n	x	Withers	1848
Beaminster, Holy Trinity	x	x	x	Carver and Giles	1849
Tincleton, St John Evangelist	n	n	n	Ferrey	1849
Little Bredy, St Michael	n	n	n	Ferrey	1850
Child Okeford, St Nicholas	n	n	n	T.H. Wyatt, T.H. Wyatt, Whippel and Co	1850
Sherborne, Abbey	n	n	n	Slater and Carpenter	1850
Chilfrome, Holy Trinity	n	n	n	x	1852
Long Crichel, St Mary	n	n	ps (to	x	1852
Tarrant Keyneston, All Saints	n	n	n	T.H. Wyatt	1852
Evershot, St Osmund	n	n	n	Shout, Shout	1852
Brownsea Island, St Mary	n	n	n	x	1853
Fishpond, St John Baptist	n	n	n	x	1854
Powerstock, St Mary	ps	n	ps	Hicks	1854
Winfrith Newburgh, St Christopher	y	y	y	x	1854
Preston, St Andrew	ps	ps	ps	T.H. Wyatt	1855
Tolpuddle, St John Evangelist	n	n	n	T.H.Wyatt	1855
Cattistock, St Peter and St Paul	n	n	n	Scott, Scott jnr	1857
Wimborne Minster, St Cuthburga	ps	ps	ps	T.H. Wyatt, Pearson	1857
Askerswell, St Michael	ps	ps	ps	Bury	1858
Stourpaine, Holy Trinity	n	n	ps	T.H. Wyatt	1858
Chetnole, St Peter	n	n	n	Slater and Carpenter	1859
Corfe Castle, St Edward	ps	n	n	T.H. Wyatt	1859
Sturminster Marshall, St Mary	n	n	n	Woodyer	1859
Swanage, All Saints	n	n	n	T.H.Wyatt	1859
Bridport, St Mary	x	n	n (trar	Hicks	1860
Coombe Keynes, Holy Rood	n	n	n	Hicks	1860
Gussage All Saints, All Saints	ps	ps	ps	Christian	1860
Athelhampton, St John	n	n	n	Hicks	1861
Kingston Magna, All Saints	n	n	n	Turner	1861
Winterborne Houghton, St Andrew	n	n	n	T.H. Wyatt	1861
Woodsford, St John Evangelist	n	n	n	T.H. Wyatt	1861
Buckhorn Weston, St John Baptist	ps	pr	ps (to	Crickmay	1861
Bettiscombe, St Stephen	n	n	n	Hicks	1862
Long Bredy, St Peter	n	ps	ps (to	x	1862
Beaminster, St Mary	ps	ps	ps	White	1862
Batcombe, St Mary	n	n	n	Hicks	1864
Wool, Holy Rood	ps	n	ps	Hicks	1864
Eype, St Peter	n	n	n	Bury (Boulton carver)	1865
Okeford Fitzpaine, St Andrew	n	n	n	Hicks	1865
Compton Abbas, St Mary	n	n	n	Evans	1866
Thornford, St Mary Magdalene	n	n	n	Slater and Carpenter	1866
Compton Abbas West, [? Dedication]	n	n	n	Hicks	1867
Piddlehinton, St Mary	pr	n	pr	Christian	1867
Broadwindsor, St John Baptist	ps	ps	ps (sc	Allen	1868
Milton on Stour, St Simon and St Jude	n	n	n	Slater and Carpenter	1868
Turnworth, St Mary	n	n	n	Crickmay	1869
West Lulworth, Holy Trinity	n	n	n	Hicks (supervised by Crickmay)	1869

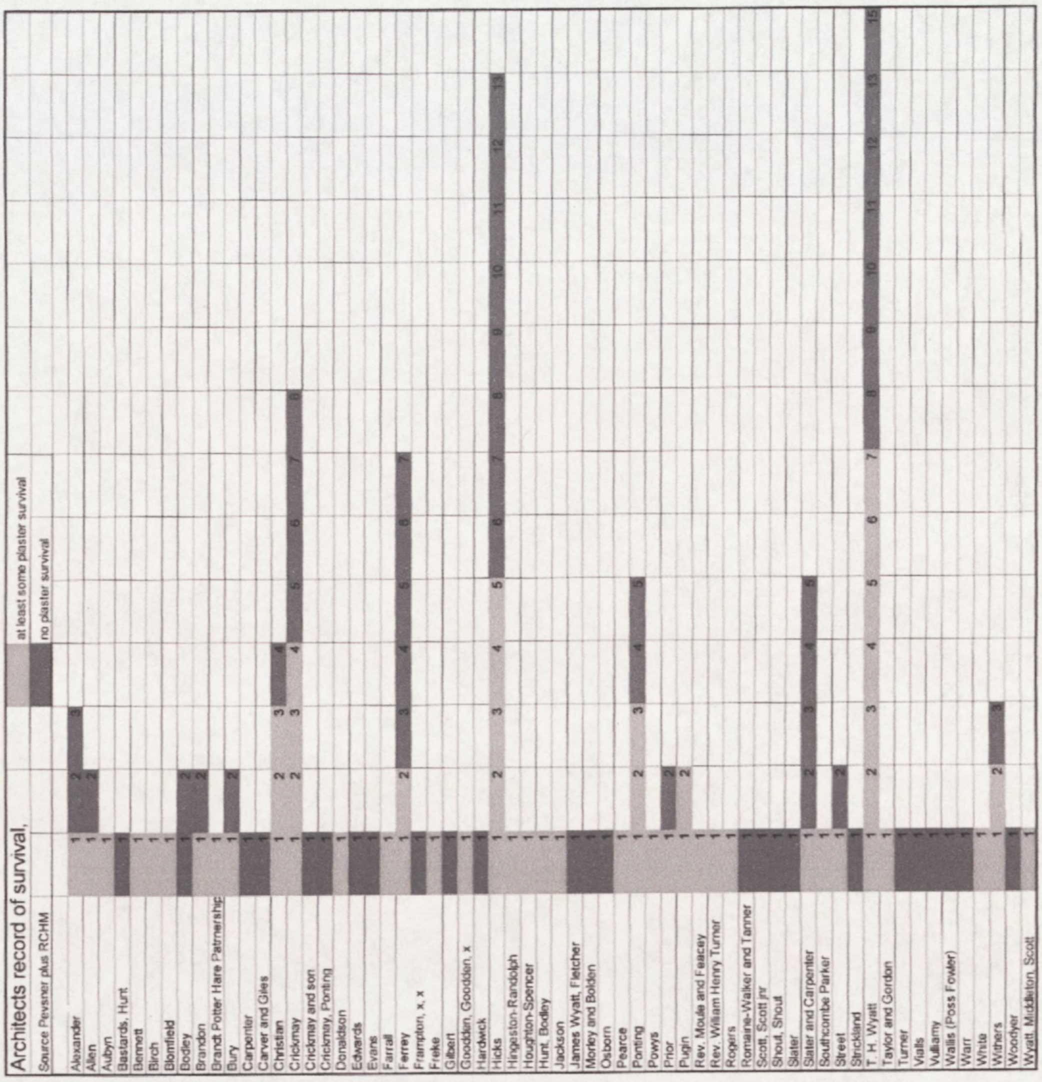
12.22 : Surveyed churches by restoration date, continued.

West Milton, St Mary Magdalene	n	n	n	Crickmay ('worked with' Hansford)	1869
Pulham, St Thomas Becket	ps	ps	ps	Hingeston-Randolph	1870
Sixpenny Handley, St Mary	n	n	n	Crickmay	1870
Toller Whelme, St John	n	n	n	Warr	1870
Winterborne Monkton, St Michael (RCHM St Simon) and S	ps	ps	ps	Christian	1870
Iwerne Minster, St Mary	ps	n	ps (si	T.H. Wyatt, Pearson	1870
Dewlish, All Saints	y	n	y (nor	T.H. Wyatt	1872
Kimmeridge, [? Dedication]	ps	ps	x	x	1872
Winterborne Kingston, St Nicholas	n	n	n	Street	1872
Wootton Fitzpaine, [? Dedication]	ps	ps	y	Birch	1872
Longburton, St James	ps	ps	ps	Farrall	1873
Ashmore, St Nicholas	n	n	n	Edwards	1874
Tarrant Hinton, St Mary	n	n	n	Ferrey	1874
Corscombe, St Mary	n	n	n	Allen	1875
Cranborne, St Mary And St Bartholomew.	y	ps	y	Brandon	1875
Canford Magna, [? Dedication]	n	n	n	Brandon	1876
Langton Matravers, St George	n	n	y (low	Crickmay	1876
Stoke Abbott, St Mary	ps	ps	n	Aubyn	1877
Chaldon Herring, St Nicholas	n	n	n	Crickmay	1878
Bourton, St George	n	n	n	Christian, Ponting	1878
Spetisbury, St John Baptist	n	n	ps (to	T. H. Wyatt	1879
Warmwell, Holy Trinity	y	n	x	Bennett	1881
Beer Hackett, St Michael	n	n	n	Crickmay, Ponting	1882
Chideock, St Giles	ps	n	ps	Crickmay	1883
Owermoigne, St Michael	ps	ps	ps	Jackson	1883
Farnham, St Laurence	ps	n	n	x	1886
Bothenhampton, Holy Trinity	n	n	n	Prior	1887
Shillingstone, Holy Rood	ps (sc	n	n	Hunt, Bodley	1888
Stratton, St Mary	n	n	n	Crickmay and son	1891
Toller Porcorum, St Peter and St Andrew	n	ps	n	Taylor and Gordon	1891
Woodlands, Ascension	n	n	n	Bodley	1892
West Knighton, St Peter	y	ps	y	Hicks (Hardy)	1894
Hampreston, All Saints	n	n	n	Romaine-Walker and Tanner	1896
Burton Bradstock, St Mary	ps	ps	ps (nc	Prior	1897
West Stafford, St Andrew	y	ps	ps	Ponting	1898
Kingston Lacy, St Stephen	n	n	n	Ponting	1906
Dorchester, Fordington, St George	x	x	y	Rev. Moule and Feacey	1906
Ibberton, St Eustace	n	n	n	Ponting	1907
South Perrott, St Mary	ps	ps	ps (tra	Southcombe Parker	1907
Puddletown, St Mary	y	pr	pr	Ponting	1910
Whitcombe, [? Dedication]	y	y	y	x	1912
Winterborne Tomson, St Andrew	y	y	y	Powys	1931
Hamworthy, St Michael	n	n	n	Morley and Bolden	1958
Cerne Abbas, St Mary	y	ps	ps (sc	T.H. Wyatt	1960
Abbotsbury, Abbey	n	n	n	x	x
Abbotsbury, St Nicholas	y	y	y	x	x
Abbotsbury, St Catherine's Chapel.	n	n	n	x	x
Affpuddle, St Laurence	pr	pr	n	T.H. Wyatt	x
Arne, St Nicholas	pr	pr	x	x	x
Belchalwell, St Aldhelm	ps	n	n	x	x
Bincombe, Holy Trinity	ps	ps	x	x	x
Blandford St Mary, St Mary	n	ps	n	Pitt	x
Bothenhampton, Old Church	ps	ps	x	x	x
Bradford Abbas, St Mary	n	n	n	x	x
Buckland Ripers, St Nicholas	n	n	n	x	x

12.22 : Surveyed churches by restoration date, continued.

Burleston, [? Dedication] ruin	n	y	ps	x	x
Chalbury, All Saints	pr	pr	n	x	x
Cheselbourne, St Martin	ps	ps	ps	x	x
Compton Abbas, Old Church (ruin)	n	n	y	x	x
Dorchester, St Peter	n	n	n	Hicks	x
Edmondsham, St Nicholas	ps	ps	ps	x	x
Fleet, Old Church	n	ps	n	x	x
Frome St Quintin, St Quintin	n	ps	n	x	x
Frome Vauchurch, [? Dedication]	pr	pr	n	x	x
Godmanstone, Holy Trinity	ps	ps	ps	x	x
Gussage St Andrew, St Andrew	y	ps	ps	x	x
Gussage St Michael, St Michael	ps	ps	ps	Street	x
Knowlton (inside circles), ruin	y	y	y (tow	x	x
Lillington, St Martin	ps	ps	ps	Withers	x
Litton Cheyney, St Mary	ps	ps	y (por	x	x
Loders, St Mary Magdalene	y	ps	ps	x	x
Lyme Regis, St Michael	ps	ps	n	x	x
Maiden Newton, St Mary	ps	ps	ps	x	x
Mapperton, All Saints	ps	ps	ps	x	x
Melbury Bubb, St Mary	n	n	n	Withers	x
Netherbury, St Mary	pr	pr	x	x	x
Nether Cerne, All Saints	ps	ps	ps	x	x
Nether Compton, St Nicholas	ps	ps	ps	x	x
Pamphill, St Margaret and St Andrew	ps	ps	ps	x	x
Portesham, St Peter	ps	ps	n	x	x
Portland, Easton, St Andrew, (ruin)	n	n	n	Merrick	x
Radipole, St Ann	pr	pr	pr	x	x
Ryme Intrinseca, St Hippolyte	ps	ps	x	x	x
St Aldhelm's Head, St Aldhelm's Chapel	n	n	n	x	x
Shaftesbury, St Peter	n	n	n	x	x
Shapwick, St Bartholomew	ps	ps	y	Rogers	x
Silton, St Nicholas	ps	ps	ps	x	x
Stanton St Gabriel, Old Church, ruin	n	n	n	x	x
Steeple, St Michael	ps	ps	ps (to	x	x
Stinsford, St Michael	y	ps	ps	x	x
Stour Provost, St Michael	pr	y (arc	n	x	x
Studland, St Nicholas	y	ps	ps	x	x
Sydling St Nicholas, St Nicholas	ps	ps	x	x	x
Tarrant Crawford, St Mary	y	y	y	x	x
Tarrant Monkton, All Saints	ps	ps	x	x	x
Tarrant Rawston, St Mary	ps	ps	ps	x	x
Tarrant Rushton, St Mary	n	n	n	x	x
Toller Fratum, St Basil	n	n	n	x	x
Turners Puddle, Holy Trinity	ps	ps	ps	x	x
Wareham, St Martin	y	y	y	x	x
Wareham, Holy Trinity	n	n	n	x	x
West Milton, Old Church	n	n	n	x	x
West Parley, All Saints	n	n	n	x	x
Whitchurch Canonicorum, St Candida St Wite	pr	pr	pr	x	x
Winterborne Came, St Peter	ps	ps	x	x	x
Winterborne St Martin, St Martin	y	y	ps	x	x
Winterbourne Abbas, St Mary	n	n	ps	x	x
Winterbourne Steepleton, St Michael	y	ps	ps	x	x
Worth Matravers, St Nicholas	ps	ps	ps	x	x
Wraxall, St Mary	ps	ps	ps	x	x
Yetminster, St Andrew	n	ps	n	x	x

12.22 : Surveyed churches by restoration date, continued.



12.23 : Architects record of survival, graphed.

All churches by architect, excluding not surveyed

	nave	chancel	other	Pevsner	RCHM
East Stour, Christ Church	n	n	n	Alexander	
Motcombe, St Mary	n	n	ps	Alexander	Alexander
Sutton Waldron, St Bartholomew	n	n	n	Alexander	Alexander
Broadwindsor, St John Baptist	ps	ps	ps	Allen	Allen
Corscombe, St Mary	n	n	n	Allen	x
Stoke Abbott, St Mary	ps	ps	n	Aubyn	x
Blandford Forum, St Peter and St Paul	n	n	n	Bastards, Hunt	
Warmwell, Holy Trinity	y	n	x	Bennett	Bennett
Wootton Fitzpaine, [? Dedication]	ps	ps	y	Birch	x
Melbury Osmond, St Osmond	ps	n	n	Blomfield	x
Woodlands, Ascension	n	n	n	Bodley	x
Wimborne St Giles, St Giles	n	n	n	Bodley, Comper	Bastards, Bodley, Comper
Canford Magna, [? Dedication]	n	n	n	Brandon	Brandon
Cranborne, St Mary And St Bartholomew.	y	ps	y	Brandon	Brandon
Cerne Abbas, St Mary	y	ps	ps	Brandt Potter Hare Patrnership	T.H. Wyatt
Askerswell, St Michael	ps	ps	ps	Bury	x
Eype, St Peter	n	n	n	Bury (Boulton carver)	
Monkton Wyld, St Andrew	n	n	n	Carpenter	
Beaminster, Holy Trinity	x	x	x	Carver and Giles	x
Gussage All Saints, All Saints	ps	ps	ps	Christian	x
Piddlehinton, St Mary	pr	n	pr	Christian	x
Winterborne Monkton, St Michael (RCHM St Sin	ps	ps	ps	Christian	x
Bourton, St George	n	n	n	Christian, Ponting	x
Chaldon Herring, St Nicholas	n	n	n	Crickmay	x
Chideock, St Giles	ps	n	ps	Crickmay	x
Hooke, St Giles	ps	ps	ps	Crickmay	x
Langton Matravers, St George	n	n	y (t	Crickmay	x, Crickmay
Sixpenny Handley, St Mary	n	n	n	Crickmay	x
Turnworth, St Mary	n	n	n	Crickmay	x
Buckhorn Weston, St John Baptist	ps	pr	ps	Crickmay	x
West Milton, St Mary Magdalene	n	n	n	Crickmay ('worked with' Hansford)	
Stratton, St Mary	n	n	n	Crickmay and son	x
Beer Hackett, St Michael	n	n	n	Crickmay, Ponting	x
Wareham, St Mary	n	ps	y	Donaldson	Donaldson (builder Cornick)
Ashmore, St Nicholas	n	n	n	Edwards	x
Compton Abbas, St Mary	n	n	n	Evans	x
Longburton, St James	ps	ps	ps	Farrall	x
Compton Valence, St Thomas of Canterbury	n	n	n	Ferrey	Ferrey
Little Bredy, St Michael	n	n	n	Ferrey	Ferrey
Melplash, Christ Church	n	n	n	Ferrey	
Osmington, St Osmund	ps	ps	ps	Ferrey	Ferrey (poss Mondey)
Tarrant Hinton, St Mary	n	n	n	Ferrey	Ferrey
Tincleton, St John Evangelist	n	n	n	Ferrey	Ferrey
Winterborne Whitechurch, St Mary	n	ps	ps	Ferrey	Ferrey
Moreton, St Nicholas	x	x	x	Frampton, x, x	Frampton, x, x, x
Iwerne Courtney (Shroton), St Mary	ps	ps	ps	Freke	x
Portland, Easton, St George	n	n	n	Gilbert	Glibert
Over Compton, St Michael	ps	n	ps	Goodden, Goodden, x	Goodden, Goodden, x
Durweston, St Nicholas	n	n	n	Hardwick	Hardwick
Athelhampton, St John	n	n	n	Hicks	x
Batcombe, St Mary	n	n	n	Hicks	x
Bettiscombe, St Stephen	n	n	n	Hicks	
Bridport, St Mary	x	n	n (t	Hicks	x
Compton Abbas West, [? Dedication]	n	n	n	Hicks	x
Coombe Keynes, Holy Rood	n	n	n	Hicks	Hicks
Dorchester, St Peter	n	n	n	Hicks	Hicks, Ponting, x, x
North Poorton, St Mary Magdalene	n	n	n	Hicks	
Okeford Fitzpaine, St Andrew	n	n	n	Hicks	x
Powerstock, St Mary	ps	n	ps	Hicks	x
Wool, Holy Rood	ps	n	ps	Hicks	Hicks
West Knighton, St Peter	y	ps	y	Hicks (Hardy)	Hardy
West Lulworth, Holy Trinity	n	n	n	Hicks (supervised by Crickmay)	Hicks and Crickmay
Pulham, St Thomas Becket	ps	ps	ps	Hingeston-Randolph	x
Puncknowle, St Mary	y	y	y	Houghton-Spencer	x
Shillingstone, Holy Rood	ps	n	n	Hunt, Bodley	x
Owermoigne, St Michael	ps	ps	ps	Jackson	Jackson
Milton Abbas, St James	n	n	n	James Wyatt, Fletcher	Chambers
Winterborne Clenston, St Nicholas	n	n	n	Louis Vulliamy	Louis Vulliamy

12.24 : Surveyed churches, by architect.

Hamworthy, St Michael	n	n	n	Morley and Bolden	
Wynford Eagle, St Lawrence	n	n	n	Osborn	x
Mosterton, St Mary	ps	n	ps	Pearce	x
Ibberton, St Eustace	n	n	n	Ponting	x
Kingston Lacy, St Stephen	n	n	n	Ponting	
Puddletown, St Mary	y	pr	pr	Ponting	x
West Stafford, St Andrew	y	ps	ps	Ponting	x, Ponting
Gillingham, St Mary	n	ps	n	Ponting and Caroe	x
Winterborne Tomson, St Andrew	y	y	y	Powys	x
Bothenhampton, Holy Trinity	n	n	n	Prior	x
Burton Bradstock, St Mary	ps	ps	ps	Prior	x
Halstock, St Mary	ps	n	n	Pugin	x
Rampisham, St Michael	ps	ps	ps	Pugin, Hicks	x
Dorchester, Fordington, St George	x	x	y	Rev. Moule and Feacey	x, x, Feacey
Trent, St Andrew	n	ps	n	Rev. William Henry Turner	
Shapwick, St Bartholomew	ps	ps	y	Rogers	x
Hampreston, All Saints	n	n	n	Romaine-Walker and Tanner	x
Cattistock, St Peter and St Paul	n	n	n	Scott, Scott jnr	x
Evershot, St Osmund	n	n	n	Shout, Shout	Shout, Shout
Pentridge, St Rumbold	n	n	n	Slater	x
Chetnole, St Peter	n	n	n	Slater and Carpenter	x
Mappowder, St Peter and St Paul	x	x	x	Slater and Carpenter	x
Milton on Stour, St Simon and St Jude	n	n	n	Slater and Carpenter	
Sherborne, Abbey	n	n	n	Slater and Carpenter	x
Thornford, St Mary Magdalene	n	n	n	Slater and Carpenter	x
South Perrott, St Mary	ps	ps	ps	Southcombe Parker	x
Gussage St Michael, St Michael	ps	ps	ps	Street	Street
Winterborne Kingston, St Nicholas	n	n	n	Street	Street
Fleet, Holy Trinity	n	n	n	Strickland	Strickland
Spetisbury, St John Baptist	n	n	ps	T. H. Wyatt	x
Corfe Castle, St Edward	ps	n	n	T.H. Wyatt	T.H. Wyatt
Dewlish, All Saints	y	n	y (r	T.H. Wyatt	x
Preston, St Andrew	ps	ps	ps	T.H. Wyatt	T.H. Wyatt
Stourpaine, Holy Trinity	n	n	ps	T.H. Wyatt	x
Tarrant Gunville, St Mary	n	n	n	T.H. Wyatt	x
Tarrant Keyneston, All Saints	n	n	n	T.H. Wyatt	T.H. Wyatt
Winterborne Houghton, St Andrew	n	n	n	T.H. Wyatt	x
Woodsford, St John Evangelist	n	n	n	T.H. Wyatt	T.H. Wyatt
Morcombelake, St Gabriel	n	n	n	T.H. Wyatt and Brandon	
Iwerne Minster, St Mary	ps	n	ps	T.H. Wyatt, Pearson	T.H. Wyatt
Wimborne Minster, St Cuthburga	ps	ps	ps	T.H. Wyatt, Pearson	T.H. Wyatt
Child Okeford, St Nicholas	n	n	n	T.H. Wyatt, T.H. Wyatt, Whippel and Co	
Swanage, All Saints	n	n	n	T.H.Wyatt	T.H. Wyatt
Tolpuddle, St John Evangelist	n	n	n	T.H.Wyatt	x
Toller Porcorum, St Peter and St Andrew	n	ps	n	Taylor and Gordon	x
Kingston Magna, All Saints	n	n	n	Turner	Turner
Marshwood, St Mary	n	n	n	Vialls	x
Charmouth, St Andrew	n	n	n	Wallis (Poss Fowler)	Fowler
Toller Whelme, St John	n	n	n	Warr	
Beaminster, St Mary	ps	ps	ps	White	x
Leigh, St Andrew	ps	ps	n	Withers	Withers
Melbury Bubb, St Mary	n	n	n	Withers (Builder Shout)	Withers
Hilfield, St Nicholas	y	n	x	Withers (poss roof only)	
Sturminster Marshall, St Mary	n	n	n	Woodyer	Woodyer
Milton Abbas, Abbey	y	n	n	Wyatt, Middleton, Scott	Wyatt, Scott
Abbotsbury, Abbey	n	n	n	x	x
Abbotsbury, St Nicholas	y	y	y	x	x
Abbotsbury, St Catherine's Chapel.	n	n	n	x	x
Affpuddle, St Laurence	pr	pr	n	x	x, T.H. Wyatt
Arne, St Nicholas	pr	pr	x	x	x
Belchalwell, St Aldhelm	ps	n	n	x	x
Bincombe, Holy Trinity	ps	ps	x	x	x
Blandford St Mary, St Mary	n	ps	n	x	Pitt
Bothenhampton, Old Church	ps	ps	x	x	x
Bradford Abbas, St Mary	n	n	n	x	x
Brownsea Island, St Mary	n	n	n	x	
Buckland Ripers, St Nicholas	n	n	n	x	
Burleston, [? Dedication] ruin	n	y	ps	x	x
Chalbury, All Saints	pr	pr	n	x	x
Charminster, St Mary	y	ps	x	x	x
Cheselbourne, St Martin	ps	ps	ps	x	x
Chickerell, St Mary	ps	ps	n	x	x
Chilfrome, Holy Trinity	n	n	n	x	x
Church Knowle, St Peter	pr	pr	ps	x	x

12.24 : Surveyed churches, by architect, continued.

Compton Abbas, Old Church (ruin)	n	n	y	x	x
Corfe Mullen, St Hubert	ps	ps	ps	x	x
Creech Grange, St John Evangelist	x	x	x	x	Bond
Edmondsham, St Nicholas	ps	ps	ps	x	x
Farnham, St Laurence	ps	n	n	x	x
Fifehead Magdalen, St Mary Magdalene	n	n	n	x	x
Fishpond, St John Baptist	n	n	n	x	
Fleet, Old Church	n	ps	n	x	x
Frampton, St Mary	n	n	n	x	Ferrey
Frome St Quintin, St Quintin	n	ps	n	x	x
Frome Vauchurch, [? Dedication]	pr	pr	n	x	x
Godmanstone, Holy Trinity	ps	ps	ps	x	x
Gussage St Andrew, St Andrew	y	ps	ps	x	x
Kimmeridge, [? Dedication]	ps	ps	x	x	x
Knowlton (inside circles), ruin	y	y	y (	x	
Langton Herring, St Peter	y	ps	y	x	x
Lillington, St Martin	ps	ps	ps	x	Withers
Litton Cheyney, St Mary	ps	ps	y (	x	x
Loders, St Mary Magdalene	y	ps	ps	x	x
Long Bredy, St Peter	n	ps	ps	x	x
Long Crichel, St Mary	n	n	ps	x	x
Lyme Regis, St Michael	ps	ps	n	x	x
Maiden Newton, St Mary	ps	ps	ps	x	x
Mapperton, All Saints	ps	ps	ps	x	x
Minterne Magna, St Andrew	n	n	n	x	x
Netherbury, St Mary	pr	pr	x	x	x
Nether Cerne, All Saints	ps	ps	ps	x	x
Nether Compton, St Nicholas	ps	ps	ps	x	x
Oborne, Old Church	y	y	x	x	x
Pamphill, St Margaret and St Andrew	ps	ps	ps	x	x
Portesham, St Peter	ps	ps	n	x	x
Portland, Easton, St Andrew, (ruin)	n	n	n	x	Merrick (arch excavation
Radipole, St Ann	pr	pr	pr	x	x
Ryme Intrinseca, St Hippolyte	ps	ps	x	x	x
St Aldhelm's Head, St Aldhelm's Chapel	n	n	n	x	x
Shaftesbury, St Peter	n	n	n	x	x
Silton, St Nicholas	ps	ps	ps	x	x
Stanton St Gabriel, Old Church, ruin	n	n	n	x	x
Steeple, St Michael	ps	ps	ps	x	x
Stinsford, St Michael	y	ps	ps	x	x
Stockwood, St Edwold	ps	x	x	x	x
Stour Provost, St Michael	pr	y (i	n	x	x
Studland, St Nicholas	y	ps	ps	x	x
Swyre, Holy Trinity	ps	ps	x	x	x
Sydling St Nicholas, St Nicholas	ps	ps	x	x	
Symondsbury, St John Baptist	ps	ps	ps	x	x
Tarrant Crawford, St Mary	y	y	y	x	x
Tarrant Monkton, All Saints	ps	ps	x	x	x
Tarrant Rawston, St Mary	ps	ps	ps	x	x
Tarrant Rushton, St Mary	n	n	n	x	x
Toller Fratum, St Basil	n	n	n	x	x
Turners Puddle, Holy Trinity	ps	ps	ps	x	x
Upwey, St Laurence	y	n	y	x	
Wareham, St Martin	y	y	y	x	x
Wareham, Holy Trinity	n	n	n	x	x
West Chelborough, St Andrew	ps	ps	ps	x	x
West Milton, Old Church	n	n	n	x	
West Parley, All Saints	n	n	n	x	x
West Stour, St Mary	ps	pr	n	x	x
Whitcombe, [? Dedication]	y	y	y	x	x
Whitchurch Canonicorum, St Candida St Wite	pr	pr	pr	x	x
Winfrith Newburgh, St Christopher	y	y	y	x	x
Winterborne Came, St Peter	ps	ps	x	x	x
Winterborne St Martin, St Martin	y	y	ps	x	x
Winterborne Stickland, St Mary	y	y	y	x	x
Winterbourne Abbas, St Mary	n	n	ps	x	x
Winterbourne Steepleton, St Michael	y	ps	ps	x	x
Witchampton, St Mary and St Cuthberga	n	n	n	x	x
Worth Matravers, St Nicholas	ps	ps	ps	x	x
Wraxall, St Mary	ps	ps	ps	x	x
Yetminster, St Andrew	n	ps	n	x	x
Pilsdon, St Mary	y	y	x	x, x	x

12.24 : Surveyed churches, by architect, continued.

All Churches	Plaster survival			Architect		Restoration dates	
not surveyed shaded thus							
no plaster shaded thus							
Source	nave	chancel	other	Pevsner	RCHM	Pevsner	RCHM
Abbotsbury, Abbey	n	n	n	x	x	x	x
Abbotsbury, St Nicholas	y	y	y	x	x	x	1638, 1751, 1807, 1885, St 1930
Abbotsbury, St Catherine's Chapel.	n	n	n	x	x	x	1742, late 19th c
Affpuddle, St Laurence	pr	pr	n	x	x, T.H. Wyatt	x	1840, 1875
Alderholt, St James	x	x	x	Prior	x	1849	1849
Almer, St Mary	x	x	x	Bastards	x	1800	1720, 185x
Alton Pancras, St Pancras	x	x	x	Christian, Crickmay	x	1874, 1875	x
Anderson, St Michael	x	x	x	x	x	1889	x
Arne, St Nicholas	pr	pr	x	x	x	x	185x, 1952
Ashmore, St Nicholas	n	n	n	Edwards	x	1874	1874
Askerswell, St Michael	ps	ps	ps	Bury	x	1858	1858
Athelhampton, St John	n	n	n	Hicks	x	1861	1862
Batcombe, St Mary	n	n	n	Hicks	x	1864	1864
Beaminster, Holy Trinity	x	x	x	Carver and Giles	x	1849	1849
Beaminster, St Mary	ps	ps	ps	White	x	1862, 1874	1767, 1794, 1860, 1889
Beer Hackett, St Michael	n	n	n	Crickmay, Ponting	x	1882, 1897	1897
Belchalwell, St Aldhelm	ps	n	n	x	x	x	189x
Bere Regis, St John Baptist	x	x	x	x	x,x, Street	x	1760, 1830, 1875,
Bettiscombe, St Stephen	n	n	n	Hicks		1862	x
Bincombe, Holy Trinity	ps	ps	x	x	x	x	1862
Bindon Abbey, ruin	x	x	x	x	x	x	16xx
Bishops Caundle, St Peter and St Paul	x	x	x	Slater	x	1864	1864
Blackdown, Holy Trinity	x	x	x	Bracebridge		1839	
Blandford Forum, St Peter and St Paul	n	n	n	Bastards, Hunt		1733, 1896	1793, 1896
Balndford Forum, St Leonard's Chapel	x	x	x	x	x	x	x
Blandford St Mary, St Mary	n	ps	n	x	Pitt	x	1711, 1837, 1862
Bloxworth, St Andrew	x	x	x	Evans	x, Evans, x, x	1870	168x, 1870, 1888, 1965
Bothenhampton, Old Church	ps	ps	x	x	x	x	x
Bothenhampton, Holy Trinity	n	n	n	Prior	x	1887	1889

12.25 : All churches, general data.

Bourton, St George	n	n	n	Christian, Ponting	x	1878, 1903	1813, 1880
Boveridge, St Aldhelm	x	x	x	x		1838	
Bradford Abbas, St Mary	n	n	n	x	x	x	1858, 1890, 1906, 1911
Bradford Peverell, St Mary	x	x	x	Burton		1849	
Bradpole, Holy Trinity	x	x	x	x, Ponting	x	1845, 1897	1845, 1863, 1897,
Bridport, St Mary	x	n	n (trai	Hicks	x	1860	1860
Bridport, St Andrew	x	x	x	Bury	x	1860	x
Bridport, St Swithun	x	x	x	Wallis	x	1826	1827
Broadmayne, St Martin	x	x	x	Hicks	Hicks	1865	1865
Broadoak, St Paul	x	x	x	Bury		1865	
Broadstone, St John Baptist	x	x	x	Fletcher		1888	
Broadwey, St Nicholas	x	x	x	x, x, x, Crickmay and son		1815, 1838, 1896, 1901	
Broadwindsor, St John Baptist	ps	ps	ps (sc	Allen	Allen	1868	1868
Brownsea Island, St Mary	n	n	n	x		1853	
Buckhorn Weston, St John Baptist	ps	pr	ps (to	Crickmay	x	1861, 1870	1861, 1870
Buckland Newton, Holy Rood	x	x	x	T.H. Wyatt	x	1870	18xx
Buckland Ripers, St Nicholas	n	n	n	x		x	
Burleston, [? Dedication] ruin	n	y	ps	x	x	x	1910
Burstock, St Andrew	x	x	x	Peters	x	1877	1877
Burton	x	x	x	x	x	x	x
Burton Bradstock, St Mary	ps	ps	ps (nc	Prior	x	1897	1897
Canford Magna, [? Dedication]	n	n	n	Brandon	Brandon	1876	1829, 1876
Catherston Leweston, St Mary	x	x	x	Pearson	x	1858	x
Cattistock, St Peter and St Paul	n	n	n	Scott, Scott jnr	x	1857, 1874	1857, 1940
Caundle Marsh, St Peter and St Paul	x	x	x	Shout	Shout, Shout	1857	1857
Cerne Abbas, St Mary	y	ps	ps (sc	Brandt Potter Hare Patrnership	T.H. Wyatt	1960's [?]	1870
Chalbury, All Saints	pr	pr	n	x	x	x	17xx
Chaldon Herring, St Nicholas	n	n	n	Crickmay	x	1878	1877
Charborough, St Mary	x	x	x	x		1775	
Charlton Marshall, St Mary	x	x	x	Bastards	x	1713	17xx
Charminster, St Mary	y	ps	x	x	x	1838	1838, 1895
Charmouth, St Andrew	n	n	n	Wallis (Poss Fowler)	Fowler	1836	1836
Chedington, St James	x	x	x	Carver, Vialls	x	1840, 1898	1841
Cheselbourne, St Martin	ps	ps	ps	x	x	x	1874

12.25 : All churches, general data, continued.

Chetnole, St Peter	n	n	n	Slater and Carpenter	x	1859	1860, 1897
Chettle, St Mary	x	x	x	Morris and Henson	x	1849	1849
Chickerell, St Mary	ps	ps	n	x	x	1834, 1865	1722, 1834, 1865, 1875, 1896
Chideock, St Giles	ps	n	ps	Crickmay	x	1883	1880
Chilcombe, [? Dedication]	x	x	x	x	x	x	19xx
Child Okeford, St Nicholas	n	n	n	T.H. Wyatt, T.H. Wyatt, Whippel and Co		1850, 1878, 1911	187x
Chilfrome, Holy Trinity	n	n	n	x	x	1852	1852, 1864
Church Knowle, St Peter	pr	pr	ps	x	x	1833-41	17xx, 1833
Colehill, St Michael	x	x	x	Caroe	x	1893	x
Compton Abbas, St Mary	n	n	n	Evans	x	1866	1858, 1867
Compton Abbas, Old Church (ruin)	n	n	y	x	x	x	x
Compton Abbas West, [? Dedication]	n	n	n	Hicks	x	1867	x
Compton Valence, St Thomas of Canterbury	n	n	n	Ferrey	Ferrey	1839	1838
Coombe Keynes, Holy Rood	n	n	n	Hicks	Hicks	1860	1860
Corfe Castle, St Edward	ps	n	n	T.H. Wyatt	T.H. Wyatt	1859	1860
Corfe Mullen, St Hubert	ps	ps	ps	x	x	1841	1850, 1865, 1930
Corscombe, St Mary	n	n	n	Allen	x	1875	17xx, 1878
Cranborne, St Mary And St Bartholomew.	y	ps	y	Brandon	Brandon	1875	1874
Creech Grange, St John Evangelist	x	x	x	x	Bond	1746	1746, 1849, 1868
Dewlish, All Saints	y	n	y (nor	T.H. Wyatt	x	1872	1872
Dorchester, St Peter	n	n	n	Hicks	Hicks, Ponting, x, x	x	1856, 1905, 1934, 1961
Dorchester, All Saints	x	x	x	Ferrey	Ferrey	1843	1843
Dorchester, Fordington, St George	x	x	y	Rev. Moule and Feacey	x, x, Feacey	1906-27	1754, 1833, 1907
Dorchester, St Mary	x	x	x	Ponting	x	1910	x
Dorchester, Holy Trinity	x	x	x	Ferrey	x	1875	x
Drimpton, St Mary	x	x	x	Allen		1867	
Durweston, St Nicholas	n	n	n	Hardwick	Hardwick	1847	1846
East Burton, [? dedication]	x	x	x	Parkinson	Parkinson	1836	1839
East Holme, St John Evangelist	x	x	x	Hicks	Hicks	1866	1866
East Lulworth, St Andrew	x	x	x	Hicks	x, Hicks	1864	1780, 1864
East Orchard, St Thomas	x	x	x	Evans and Pullman, Christian		1859, x	1859
East Stoke, St Mary	x	x	x	Owen, Colson and Son	Owen	1828, 1885	1828, 1885
East Stour, Christ Church	n	n	n	Alexander		1842	1842

12.25 : All churches, general data, continued.

Edmondsham, St Nicholas	ps	ps	ps	x	x	x	1862
Enmore Green, St John Evangelist	x	x	x	Alexander	Alexander	1843	1843
Evershot, St Osmund	n	n	n	Shout, Shout	Shout, Shout	1852, 1864	1852, 1864
Eype, St Peter	n	n	n	Bury (Boulton carver)		1865	
Farnham, St Laurence	ps	n	n	x	x	1886	1835, 1886
Farrington, St Peter	x	x	x	x	x	x	1839, 1856, 1899
Fifehead Magdalen, St Mary Magdalene	n	n	n	x	x	1750	1903
Fifehead Neville, All Saints	x	x	x	x	x	1736	1873
Fishpond, St John Baptist	n	n	n	x		1854	
Fleet, Old Church	n	ps	n	x	x	x	1827
Fleet, Holy Trinity	n	n	n	Strickland	Strickland	1827	1827
Folke, St Lawrence	x	x	x	x, Farrall	x, x	1628, 1875	1628, 1875
Fontmell Magna, St Andrew	x	x	x	Evans	Evans	1862	1862
Forde Abbey	x	x	x	Chard		x	
Frampton, St Mary	n	n	n	x	Ferrey	1695, 1820, 1865	1695, 1747, 1862, 1871, 1878
Frome St Quintin, St Quintin	n	ps	n	x	x	x	1881
Frome Vauchurch, [? Dedication]	pr	pr	n	x	x	x	1879
Gillingham, St Mary	n	ps (s(	n	Ponting and Caroe	x	1838, 1908, 1921	1838, 1840, 1908
Glanvilles Wooton, St Mary	x	x	x	Crickmay	x	1875	1876
Goathill, St Peter	x	x	x	x	x	1873	1804, 1873, 1878
Godmanstone, Holy Trinity	ps	ps	ps	x	x	x	1848
Gussage All Saints, All Saints	ps	ps	ps	Christian	x	1860's	1864
Gussage St Andrew, St Andrew	y	ps	ps	x	x	x	1857
Gussage St Michael, St Michael	ps	ps	ps	Street	Street	x	1857
Halstock, St Mary	ps	n	n	Pugin	x	1845	1845
Hammoon, St Paul	x	x	x	x	x	1885	1885
Hampreston, All Saints	n	n	n	Romaine-Walker and Tanner	x	1896	1896
Hamworthy, St Michael	n	n	n	Morley and Bolden		1958	
Hanford, St Michael and all Angels	x	x	x	x	x	x	x
Haydon, St Catherine	x	x	x	Carpenter		1883	
Hazelbury Bryan, St Mary and St James	x	x	x	x	x	x	1827, 1895
Hermitage, St Mary	x	x	x	x		x	
Hilfield, St Nicholas	y	n	x	Withers (poss roof only)		1848 (NB P. is wrong-roof only 19c)	
Hilton, All Saints	x	x	x	x	x	x	x

12.25 : All churches, general data, continued.

Hinton Martell, St John Evangelist	x	x	x	Crickmay	x	1870	1896
Hinton Parva, St Kenelm	x	x	x	x	x	1860	1860
Hinton St Mary, St Peter	x	x	x	Oborne	x	1846	1846
Holnest, St Mary	x	x	x	x	x	1855	1855
Holt, St James	x	x	x	Tulloch, T.H. Wyatt	Tulloch	1834, 1875	1836
Holwell, St Lawrence	x	x	x	Crickmay	x	1885	1770, 1885
Hooke, St Giles	ps	ps	ps	Crickmay	x	1840, 1874	1874
Horton, St Wolfreda	x	x	x	Chapman	x	1722	1722, 1869
Ibberton, St Eustace	n	n	n	Ponting	x	1907	1903
Iwerne Courtney (Shroton), St Mary	ps	ps	ps	Freke	x	1610	1610, 1872
Iwerne Minster, St Mary	ps	n	ps (si	T.H. Wyatt, Pearson	T.H. Wyatt	1870, 1880	1871
Iwerne Stepleton, St Mary	x	x	x	x	x	x	x
Kimmeridge, [? Dedication]	ps	ps	x	x	x	1872	1872
Kingston, Old Church	x	x	x	Repton		1833	
Kingston, St James	x	x	x	Street		1873	
Kingston Lacy, St Stephen	n	n	n	Ponting		1906	
Kingston Magna, All Saints	n	n	n	Turner	Turner	1861	1862
Knowlton (inside circles), ruin	y	y	y (tow	x		x	
Langton Herring, St Peter	y	ps	y	x	x	1827, 1858	1827, 1858
Langton Long (Blandford), All Saints	x	x	x	T.H. Wyatt	T.H. Wyatt	1861	1861
Langton Matravers, St George	n	n	y (tow	Crickmay	x, Crickmay	1876	1828, 1875
Leigh, St Andrew	ps	ps	n	Withers	Withers	1840, x	1854
Lewcombe, St James	x	x	x	x	x	x	17xx
Leweston, Holy Trinity	x	x	x	Fitzjames	x	1616	1616
Lillington, St Martin	ps	ps	ps	x	Withers	x	1848
Little Bredy, St Michael	n	n	n	Ferrey	Ferrey	1850	1850
Litton Cheyney, St Mary	ps	ps	y (por	x	x	x	1878
Loders, St Mary Magdalene	y	ps	ps	x	x	x	1836, 1900
Long Bredy, St Peter	n	ps	ps (to	x	x	1862	17xx, 1863
Longburton, St James	ps	ps	ps	Farrall	x	1873	1873
Long Crichel, St Mary	n	n	ps (to	x	x	1852	1852
Lydlinch, St Thomas Becket	x	x	x	x	x	1838	1875
Lyme Regis, St Michael	ps	ps	n	x	x	x	1824, 1834, 1885, 1901, 1930, 1933
Lyscombe, ruin	x	x	x	x		x	
Lytchett Heath, St Aldhelm	x	x	x	Crickmay and Son		1898	
Lytchett Matravers, St Mary	x	x	x	x	x	1505	1500, 1873, 1876

12.25 : All churches, general data, continued.

Lytchett Minster, [? Dedication]	x	x	x	Tulloch	Tulloch	1833	1833
Maiden Newton, St Mary	ps	ps	ps	x	x	x	1886
Manston, St Nicholas	x	x	x	x	x	1534, 1885	1885
Mapperton, All Saints	ps	ps	ps	x	x	x	1846, 1908
Mappowder, St Peter and St Paul	x	x	x	Slater and Carpenter	x	1868	x
Margaret Marsh, St Margaret	x	x	x	Crickmay	x	1872	1872
Marnhull, St Gregory	x	x	x	x	x	1852	1852, 1881, 1897
Marshwood, St Mary	n	n	n	Vialls	x	1841, 1884	1841
Melbury Abbas, St Thomas	x	x	x	Evans	Evans	1851	1852
Melbury Bubb, St Mary	n	n	n	Withers (Builder Shout)	Withers	x	1854
Melbury Osmond, St Osmond	ps	n	n	Blomfield	x	1745, 1888	x
Melbury Sampford, St Mary	x	x	x	x	x	1874	1874, 1878
Melcombe Horsey, St Andrew	x	x	x	x	x	x	1844
Melplash, Christ Church	n	n	n	Ferrey		1845	
Milborne St Andrew, St Andrew	x	x	x	Street	x	1876	1876
Milton Abbas, Abbey	y	n	n	Wyatt, Middleton, Scott	Wyatt, Scott	1789, x, 1865	x, x, 1865
Milton Abbas, St James	n	n	n	James Wyatt, Fletcher	Chambers	1786, 1888	1786, 1888
Milton Abbas, St catherine's chapel	x	x	x	x	x	x	189x
Milton on Stour, St Simon and St Jude	n	n	n	Slater and Carpenter		1868	
Minterne Magna, St Andrew	n	n	n	x	x	1610, 1800	1800, 1894
Monkton Wyld, St Andrew	n	n	n	Carpenter		1848	
Morcombelake, St Gabriel	n	n	n	T.H. Wyatt and Brandon		1841	
Morden, St Mary	x	x	x	Seller	Siller	1873	1873
More Crichel, St Mary	x	x	x	x	Alexander	1850, 1886	1850
Moreton, St Nicholas	x	x	x	Frampton, x, x	Frampton, x, x, x	1776, 1841, 1848	1841, 1847, 1848
Mosterton, St Mary	ps	n	ps	Pearce	x	1833	1833
Motcombe, St Mary	n	n	ps (ni	Alexander	Alexander	1846	1846
Netherbury, St Mary	pr	pr	x	x	x	x	1848, 1850, 1894
Nether Cerne, All Saints	ps	ps	ps	x	x	x	1876
Nether Compton, St Nicholas	ps	ps	ps	x	x	x	1885
North Poorton, St Mary Magdalene	n	n	n	Hicks		1862	
North Wooton, Old Church (ruin)	x	x	x	x	x	x	1861
North Wooton, St Mary Magdalene	x	x	x	Carpenter and Ingelow	x	1883	1883
Oborne, Old Church	y	y	x	x	x	1533	180x, 195x
Oborne, St Cuthbert	x	x	x	Slater		1862	

12.25 : All churches, general data, continued.

Okeford Fitzpaine, St Andrew	n	n	n	Hicks	x	1865	1772, 1865
Osmington, St Osmund	ps	ps	ps	Ferrey	Ferrey (poss Mondey)	1846	1846
Over Compton, St Michael	ps	n	ps (nc	Goodden, Goodden, x	Goodden, Goodden, x	1776, 1821, 1877	1776, 1821, 1877
Owermoigne, St Michael	ps	ps	ps	Jackson	Jackson	1883	1883
Pamphill, St Margaret and St Andrew	ps	ps	ps	x	x	x	1963
Pentridge, St Rumbold	n	n	n	Slater	x	[?]1815, 1855	1855
Piddlehinton, St Mary	pr	n	pr	Christian	x	1867	1867
Piddletrenthide, All Saints	x	x	x	Hicks, Christian	x	1852, 1880	1847, 1852
Pilsdon, St Mary	y	y	x	x, x	x	1830, 1875	1830, 1875
Pimperne, St Peter	x	x	x	Green	x	1873	1870
Plush, St John Baptist	x	x	x	Ferrey	Ferrey	1848	1848
Poole, St James	x	x	x	Kent and Hannaford	Kent and Hannaford	1820	1819
Poole, (Branksome), St Aldhelm	x	x	x	Bodley and Garner		1892	
Poole, (Branksome), St Clement	x	x	x	Romaine-Walker and Tanner		1889	
Poole, (Branksome Park), All Saints	x	x	x	Burton and Stevens		1877	
Poole, (Longfleet), St Mary	x	x	x	x(not listed)	Blore,x	1833, 1915	
Poole, (Parkstone), St Peter	x	x	x	Tulloch, Rogers, Pearson	x	1833, 1876, 1881	x
Portesham, St Peter	ps	ps	n	x	x	x	x
Portesham, (Corton), St Bartholomew	x	x	x	x	x	x	1897
Portland, Easton, St Andrew, (ruin)	n	n	n	x	Merrick (arch excavation	x	1898
Portland, Easton, St George	n	n	n	Gilbert	Gilbert	1754	1754
Portland, Fortuneswell, St John Baptist	x	x	x	Monday (Wallace), Crickmay	Mondey	1839, 1872	1839
Portland, Grove, St Peter	x	x	x	Du Cane		1870	
Portland, Southwell, St Andrew	x	x	x	Crickmay		1878	
Powerstock, St Mary	ps	n	ps	Hicks	x	1854	1859
Poxwell, St John Evangelist (pulled down)	x	x	x	Evans	x	1868	1868
Poxwell, StJohn the Baptist	x	x	x	Evans	x	1868	1868
Poyntington, All Saints	x	x	x	x	x	1863	1863, 1905
Preston, St Andrew	ps	ps	ps	T.H. Wyatt	T.H. Wyatt	1855	185x
Puddletown, St Mary	y	pr	pr	Ponting	x	1910	18xx, 1910

12.25 : All churches, general data, continued.

Pulham, St Thomas Becket	ps	ps	ps	Hingeston-Randolph	x	1870	18xx
Puncknowle, St Mary	y	y	y	Houghton-Spencer	x	1660, 1891	1660, 1678, 1891
Purse Caundle, St Peter	x	x	x	x	x	x	1896, 1905
Radipole, St Ann	pr	pr	pr	x	x	x	1735, 18xx
Rampisham, St Michael	ps	ps	ps	Pugin, Hicks	x	1847, 1859	1847, 1860
Ryme Intrinseca, St Hippolyte	ps	ps	x	x	x	x	185x
St Aldhelm's Head, St Aldhelm's Chapel	n	n	n	x	x	x	1873
Salway Ash, Holy Trinity	x	x	x	Crickmay		1887	
Sandford Orcas, St Nicholas	x	x	x	x	x	x	1871
Seaborough, St John	x	x	x	x, Crickmay	x	1729, 1882	1729, 1882
Shaftesbury, St Peter	n	n	n	x	x	x	x
Shaftesbury, St James	x	x	x	T.H. Wyatt	T.H. Wyatt	1866	1866
Shaftesbury (Cann), St Rumbold	x	x	x	Walker	x	1840	1840
Shaftesbury, Holy Trinity	x	x	x	Scott, Doran Webb	Scott, Doran Webb	1841, 1908	1840, 1908
Shapwick, St Bartholomew	ps	ps	y	Rogers	x	x	1878
Sherborne, Abbey	n	n	n	Slater and Carpenter	x	1850-84	1849, 1856, 1884, 1921
Sherborne, St Mary Magdalene	x	x	x	Slater	x	1860	x
Shillingstone, Holy Rood	ps (sc	n	n	Hunt, Bodley	x	1888, 1910	1858, 1888, 1902
Shipton Gorge, St Martin	x	x	x	Hicks	x	1861	1862
Silton, St Nicholas	ps	ps	ps	x	x	x	1869
Sixpenny Handley, St Mary	n	n	n	Crickmay	x	1870	1877
South Perrott, St Mary	ps	ps	ps (tra	Southcombe Parker	x	1907	1907
Spetisbury, St John Baptist	n	n	ps (to	T. H. Wyatt	x	1879	1858, 1868, 1895
Stalbridge, St Mary	x	x	x	Boucher, T.H. Wyatt	x	1868, 1878	1868, 1877
Stanton St Gabriel, Old Church, ruin	n	n	n	x	x	x	x
Steeple, St Michael	ps	ps	ps (to	x	x	x	1852
Stinsford, St Michael	y	ps	ps	x	x	x	1868, 1883, 1910
Stock Gaylard, St Barnabas	x	x	x	Fletcher		1884	
Stockwood, St Edwold	ps	x	x	x	x	1638	1636, 19xx
Stoke Abbott, St Mary	ps	ps	n	Aubyn	x	1877	1826, 1878
Stoke Wake, All Saints	x	x	x	Crickmay	x	1872	1872
Stourpaine, Holy Trinity	n	n	ps	T.H. Wyatt	x	1858	1858
Stour Provost, St Michael	pr	y (arc	n	x	x	x	18xx
Stour Row, All Saints	x	x	x	Hicks		1867	
Stourton Caundle, St Peter	x	x	x	x	x	x	1902
Stratton, St Mary	n	n	n	Crickmay and son	x	1891	1891

12.25 : All churches, general data, continued.

Studland, St Nicholas	y	ps	ps	x	x	x	1881, 1930
Sturminster Marshall, St Mary	n	n	n	Woodyer	Woodyer	1859	1859
Sturminster Newton, St Mary	x	x	x	Evans	x	1825	182x
Sutton Waldron, St Bartholomew	n	n	n	Alexander	Alexander	1847	1847
Swanage, All Saints	n	n	n	T.H.Wyatt	T.H. Wyatt	1859	1859
Swanage (Herston), St Mark	x	x	x	Hicks, Crickmay		1869, 1870	
Swyre, Holy Trinity	ps	ps	x	x	x	1843	1843, 1845
Sydling St Nicholas, St Nicholas	ps	ps	x	x		x	175x, 18xx
Symondsbury, St John Baptist	ps	ps	ps	x	x	1818, 1920	18xx, 1923
Tarrant Crawford, St Mary	y	y	y	x	x	x	x
Tarrant Gunville, St Mary	n	n	n	T.H. Wyatt	x	1844	1843
Tarrant Hinton, St Mary	n	n	n	Ferrey	Ferrey	1874	1874
Tarrant Keyneston, All Saints	n	n	n	T.H. Wyatt	T.H. Wyatt	1852	1852
Tarrant Monkton, All Saints	ps	ps	x	x	x	x	1873
Tarrant Rawston, St Mary	ps	ps	ps	x	x	x	179x, 181x
Tarrant Rushton, St Mary	n	n	n	x	x	x	x
Thorncombe, St Mary	x	x	x	Allen	x	1867	1866
Thornford, St Mary Magdalene	n	n	n	Slater and Carpenter	x	1866	1866
Tincleton, St John Evangelist	n	n	n	Ferrey	Ferrey	1849	1849
Todber, [? Dedication]	x	x	x	x	x	1879	1879
Toller Fratum, St Basil	n	n	n	x	x	x	18xx
Toller Porcorum, St Peter and St Andrew	n	ps	n	Taylor and Gordon	x	1891	1891, 1894
Toller Whelme, St John	n	n	n	Warr		1870	
Tolpuddle, St John Evangelist	n	n	n	T.H.Wyatt	x	1855	1855, 1885
Trent, St Andrew	n	ps	n	Rev. William Henry Turner		1840	1694, 1729, 1840, 1925
Turners Puddle, Holy Trinity	ps	ps	ps	x	x	x	1758, 1859
Turnworth, St Mary	n	n	n	Crickmay	x	1869	1869
Tyneham, St Mary	x	x	x	x	x, Bond, Ferrey, Ferrey	1852	1744, 180x, 18xx, 188x
Upcerne, [? Dedication]	x	x	x	x	x	1870	1870, 1912
Upwey, St Laurence	y	n	y	x		1838, 1906	1838, 1891, 1906
Verwood, St Michael	x	x	x	Adye and Adye	x	1893	1870
Walditch, St Mary	x	x	x	x		1863	1863
Wareham, St Mary	n	ps	y	Donaldson	Donaldson (builder Cornick)	1841	1840

12.25 : All churches, general data, continued.

Wareham, St Martin	y	y	y	x	x	x	1712, 1935
Wareham, Holy Trinity	n	n	n	x	x	x	16xx, 17xx, 19xx
Warmwell, Holy Trinity	y	n	x	Bennett	Bennett	1881	1851, 1881
West Chelborough, St Andrew	ps	ps	ps	x	x	1638, 1751	1751, 1894
West Knighton, St Peter	y	ps	y	Hicks (Hardy)	Hardy	1894	1893
West Lulworth, Holy Trinity	n	n	n	Hicks (supervised by Crickmay)	Hicks and Crickmay	1869	1869
West Milton, Old Church	n	n	n	x		x	
West Milton, St Mary Magdalene	n	n	n	Crickmay ('worked with' Hansford)		1869	
West Moors, St John	x	x	x	x	x	x	x
West Moors, St Mary	x	x	x	Stanley	x	1897	x
West Orchard, [? Dedication]	x	x	x	T.H. Wyatt	T.H. Wyatt	1876	1876
West Parley, All Saints	n	n	n	x	x	x	1896
West Stafford, St Andrew	y	ps	ps	Ponting	x, Ponting	1898	1640, 1898
West Stour, St Mary	ps	pr	n	x	x	1840	1840
Weymouth, St Mary	x	x	x	Hamilton	Hamilton	1815	1815
Weymouth, St John	x	x	x	Bury	x	1850	x
Weymouth, St Martin	x	x	x	Ponting	x	1908	x
Weymouth, St Paul	x	x	x	Fellowes Prynne	x	1893	x
Weymouth, Holy Trinity	x	x	x	Bury, Crickmay and Son	Philip Wyatt	1834, 1887	1834, 1887
Whitcombe, [? Dedication]	y	y	y	x	x	1912	17xx
Whitchurch Canonicorum, St Candida St Wite	pr	pr	pr	x	x	x	1738, 1822, 1832, 1847, 1887, 1899, 1926
Wimborne Minster, St Cuthburga	ps	ps	ps	T.H. Wyatt, Pearson	T.H. Wyatt	1857, 1891	1855
Wimborne, Leigh, St John Evangelist	x	x	x	Fletcher		1876	
Wimborne St Giles, St Giles	n	n	n	Bodley, Comper	Bastards, Bodley, Comper	1732, 1886, 1908	1732
Winfrith Newburgh, St Christopher	y	y	y	x	x	1854	1854
Winterborne Came, St Peter	ps	ps	x	x	x	x	x
Winterborne Clenston, St Nicholas	n	n	n	Louis Vulliamy	Louis Vulliamy	1840	1840
Winterborne Houghton, St Andrew	n	n	n	T.H. Wyatt	x	1861	1861
Winterborne Kingston, St Nicholas	n	n	n	Street	Street	1872	1871
Winterborne Monkton, St Michael (RCHM St Simon) and St John	ps	ps	ps	Christian	x	1870	1870
Winterborne St Martin, St Martin	y	y	ps	x	x	x	1896
Winterborne Stickland, St Mary	y	y	y	x	x	1716	1892

12.25 : All churches, general data, continued.

Winterborne Tomson, St Andrew	y	y	y	Powys	x	1931	x
Winterborne Whitechurch, St Mary	n	ps	ps	Ferrey	Ferrey	1844	1844
Winterborne Zelston, St Mary	x	x	x	T. H. Wyatt	x	1865	1866
Winterbourne Abbas, St Mary	n	n	ps	x	x	x	1900
Winterbourne Steepleton, St Michael	y	ps	ps	x	x	x	1902
Witchampton, St Mary and St Cuthberga	n	n	n	x	x	1833, 1844	1832, 1844, 1898
Woodlands, Ascension	n	n	n	Bodley	x	1892	1892
Woodsford, St John Evangelist	n	n	n	T.H. Wyatt	T.H. Wyatt	1861	1862
Wool, Holy Rood	ps	n	ps	Hicks	Hicks	1864	1865
Woolland, [? Dedication]	x	x	x	Scott	x	1857	1855
Wootton Fitzpaine, [? Dedication]	ps	ps	y	Birch	x	1872	16xx, 1872
Worth Matravers, St Nicholas	ps	ps	ps	x	x	x	1869
Wraxall, St Mary	ps	ps	ps	x	x	x	18xx
Wyke Regis, All Saints	x	x	x	x	x	x	x
Wynford Eagle, St Lawrence	n	n	n	Osborn	x	1842	1840
Yetminster, St Andrew	n	ps	n	x	x	x	1890, 19xx

12.25 : All churches, general data, continued.

13. References and bibliography

Notes :

*Items marked ** are all offprints from specialist journals. They were found amongst unsorted course notes discovered when the author of this thesis took over course leadership of the Architectural Materials Conservation MA at Bournemouth University. They form a valuable archive, and have informed the writing of this thesis, but it has not been possible to trace the original source of this material.*

Where an ISBN number is incomplete or marked "x", it means that the edition used was not given an ISBN in the modern format, or was given no ISBN at all.

Every effort has been made to make individuals noted as references by personal communication identifiable and contactable. However, it has not been possible to gain the permission of all those involved to have their addresses revealed. In such cases an indication of their geographic base is given, and a method of contact via a third party is suggested.

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Chard, D., partner in the mortar making firm of H.J. Chard and Sons, 1 Cole Road, Bristol, BS2 0UG. Pers.coms., conversations on all aspects of lime mortar manufacture, 1985-2005.

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Dawson, D., Sometime Director of the Somerset County Museums Service, The Castle, Taunton, Somerset, TA1 4AA. Expert on many aspects of church records. Pers.coms., conversations on church history and fabric survival 1987-2005.

Deli, M., Conservator working on the Acropolis for the Greek Ministry of Culture and sometime MA Architectural Materials Conservation student at Bournemouth University. Pers.coms., conversations 1997-8.

deMaus, R., Surveyor and millwright in private practice based at Stagbatch Farm, Leominster, Herefordshire, HR6 9DA. Has been working on buildings with ultra-sound, thermography and other non-destructive testing techniques for more than 15 years. Pers.coms. conversations 1994-2005.

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Ratcliffe, T., Architect in private practice in Shropshire. Contact via SPAB, 37 Spital Square, London, E1 6DY. Active member of the SPAB with a special interest in historic plaster. Pers.coms., conversations at numerous SPAB technical days in England and Scotland, 1988-2005.

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Sapouna, S., Architect working on monuments in Northern Greece for the Greek Ministry of Culture and sometime MA Architectural Materials Conservation student at Bournemouth University. Pers.coms., conversations 1997-8.

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Wilmot, S., Surveyor in private practice based in Broadstone, Poole, Dorset. Sometime student on the MSc Architectural Materials Conservation course at Bournemouth University. Pers.coms., conversations 1997-2005

Wingate, M., architect in private practice, author on lime (see above "Holmes, S. and Wingate M."), and member of the SPAB technical panel, SPAB, 37, Spital Square, London, E1 6DY. Pers.coms., numerous conversations 1986-2005.

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13.3Biographical notes

This section is intended to provide background information to help with the interpretation of references in the text, rather than to provide full biographies of the people concerned.

Baker, Eve (deceased) : Wall paintings conservator operating throughout the UK from the 1950's to the late 1970's. Though very influential and energetic, almost nothing appears to have been published regarding her work. *(See note on Robert Baker, below)*. She attracted much controversy amongst fellow wall painting conservators, for example,. for the alleged used of liquid nylon as a consolidant for wall paintings. In later years she championed the use of lime based conservation. (Contact estate via SPAB, 37, Spital Square, London, E1 6DY.)

Baker, Robert (deceased) : Ceramicist and conservator from the 1950's to the 1970's, working across the UK. Husband of Eve. Assisted in much of her wall painting work. Developed a highly contentious lime method for the repair of stonework at Wells Cathedral. Acknowledged by many conservators to have been obsessively secretive. Appears to have kept no publishable records of his work. (Contact estate via SPAB, 37, Spital Square, London, E1 6DY.)

Baxter, Alan : Engineer in private practise specialising in the repair of ancient buildings (among other things). His practice employs a senior partner devoted to researching the reliability of different architects and contractors in transforming designs accurately in as-built reality. (Contact via 75 Cowcross Street, London, EC1M 6EL.)

Bhardwaj, Dr. M. : Head of research for the US based *Ultran* Group. Claims extensive experience in using ultrasound to analyse all aspects of historic building materials. During a 2 hour telephone conversation he suggested that *Ultran* pitch catch ultrasound equipment could be adapted to meet the needs of historic plaster survey, but that extensive development work would be needed. He was very keen to meet and develop this project further. (Contact via <ultran.com> .)

Birdsall, N. : Architect specialising in the repair of churches, including Tewkesbury Abbey. Fellow member of the SPAB Technical Panel. Numerous personal communications on all aspects of church survey and repair 1996-2005. (Contact via 3 Pottle's Alley, Hingham, Norfolk, NR9 4HS.)

Brooks, Professor C. (deceased) : Historian specialising in the literature of the Victorian period and the motivation and behaviour of Victorian architects. Sometime chairman of the Victorian Society. (Contact with estate via The Victorian Society, 1 Priory Gardens, Bedford Park, London W4 1TT .)

Bucknall, J. : Architect in private practice specialising in historic building repairs. Has provided the author with large amounts of case based information on materials and techniques. (Contact via SPAB, 37, Spital Square, London, E1 6DY.)

Burman, P. : Sometime secretary of the Council for the Care of Churches, now architectural advisor the Scottish National Trust. Has provided substantial background information to this author, particularly on personalities and ethical approaches via numerous discussions, lectures and meetings, 1985 onwards. (Contact via SPAB, 37, Spital Square, London, E1 6DY.)

Butland, Rex. : Sometime senior partner in the Sarum Partnership, which is an architectural practice specialising in the repair of churches and in quinquennial surveys. (Contact via 35 Catherine Street, Salisbury,

SP1 2DQ.)

Channer, Jill (nee Kerr) : Sometime English Heritage inspector, now with the Prince's Trust. Expert on all aspects of historic glass. (Contact via the Princes' Trust, 18 Park Square East, London NW1 4LH .)

Chard, David : Director of H.J. Chard ltd., Bristol, suppliers of mortar. This family run firm has been producing haired lime mortar for the last sixty years. (Contact via H.J. Chard and Sons, 1 Cole Road, Bristol, BS2 0UG .)

Clare, Stephen : Director of Holywell Glass, Wells. Commercial contractors specialising in the repair of historic glass. (Contact via <www.holywellglass.com>.)

Cox, Dr. Jo. : Buidling historian in private practice specialising in all aspects of historic building survey and recording. Particular expertise in relating physical survival to documentary records. (Contact via Keystone Consultancy, 50, Blackboy Hill, Exeter. EX4 0TB.)

Dallas, Ross : Sometime member of the English Heritage survey unit, now in private practice. Extensive experience in all aspects of photogrammetry and rectified photography. (Contact via 23 East Mount Road., The Mount, YORK, YO2 2BD.)

Darville, T. : Professor of Archaeology at Bournemouth University. Organised a seminar for staff at Bournemouth University, to discuss the philosophical conflicts between archaeology and conservation c.1998. (Contact via Bournemouth University, School of Conservation Sciences, Poole, Dorset, BH12 5BB.)

Dawson, Dr. D. : Sometime direct of Dorset County Museum Service, and member of Somerset Diocesan Advisory Committee. Numerous personal communications on all aspects of church history and archaeology, 1972-2005. (Contact via Somerset County Museums Service, The Castle, Taunton, Somerset, TA1 4AA.)

Deli, M. : Student on Architectural Materials Conservation MA at Bournemouth University, 1996-7, now working on historic monuments for the Greek Ministry of Culture. (Contact via Bournemouth University, School of Conservation Sciences, Poole, Dorset, BH12 5BB..)

deMaus, Robert. : Building surveyor in private practice specialising in non-destructive examination of historic buildings. Detail information provided on the practical application of ultrasound to historic building survey via meetings and lectures, 1994-2005. (Contact via The deMaus Partnership, Stagbatch Farm, Leominster, Herefordshire, HR6 9DA.)

Draper, J. : Dorset County Museum. Historian based in Dorchester, specialising in Dorset local history. (Contact via Dorset County Museum, High West Street Dorchester Dorset DT1 1XA.)

DRO (Dorset Record Office) staff : Three librarians, on two occasions in 1999, at DRO were exceptionally helpful during the initial stages of the research. (Contact via <www.dorsetforyou.com>.)

Hadlington, M. : Architect in private practice specialising in historic buildings in Scotland. Has provided extensive background information to this author via numerous meetings, site visits and shared conference platforms, 1987-2005. (Contact via SPAB, 37, Spital Square, London, E1 6DY.)

Hippsely-Cox, Charles : Architect specialising in the recording and interpretation of historic buildings, now teaching building conservation at the University of Huddersfield. (Contact via The University of Huddersfield, Queensgate, Huddersfield, HD1 3DH.)

Induni, Bruce (author of this thesis) : *For additional biographical note see preface.* Personal unpublished research referred to in the text, was conducted as an integral part of 15 years of contracting activity as a conservator on church sites including Bristol Cathedral, Portsmouth Cathedral, Tewkesbury Abbey, Boxford, Bristol (St. Nicholas), Bury St. Edmunds (St. Mary's), Deerhurst, Gloucester (St. Nicholas), Spetchley, Torbryan, Ubbeston, Upton Cresset, Winterbourne Gunner, Wroxeter, and approximately 40 others

(See chapter 14.8 for fuller list). Much additional experience has derived from membership of the Committee and technical panel of the Society for the Protection of Ancient Buildings, membership of the committee of the Buildings Lime Forum, membership of the Association for Studies in the Conservation of Historic Buildings, and from 12 years teaching building conservation at post-graduate level. (Contact via <induni@tesco.net>.)

Induni, Lizzy : Paint conservator and archaeological illustrator in private practice, with extensive interest in historic plaster. Provided much dispassionate advice and support particularly on the objectivity of visual plaster survey. (Contact via <induni@tesco.net> .)

Kirby, C. : Sales representative for *NDT Solutions,* Chesterfield. Contacted in July 2005 to check prices of *Ultran Group* ultrasound equipment. (Contact via Dunston Innovation Centre, Dunston Road, Chesterfield, Derbyshire, S41 8NG, UK.)

Kelly, Francis : Art historian and English Heritage inspector with a particularly enquiring attitude. (Contact via English Heritage, Fortress House, 23 Savile Row, London, W1X 1AB.)

McHaig, Ian : Sometime English Heritage inspector with responsibility for development of the Smeaton report into the weathering characteristics of lime mortars. Retired due to ill health before the completion of the project. (Contact via English Heritage, Fortress House, 23 Savile Row, London, W1X 1AB.)

Martin, Bill : Senior Architectural Conservator with English Heritage. (Contact via English Heritage, Fortress House, 23 Savile Row, London, W1X 1AB.)

Morshead, Sir Owen (deceased) : Dorset historian and author. Personal librarian to King George V and founder of the Dorset Historic Churches Trust. On his retirement, and throughout the nineteen fifties and nineteen sixties, he compiled a series of personal notebooks recording his visits to, and research on, most of Dorset's churches. This record is now held by the Dorset Record Office, and could benefit from further extensive research. (Possible contact with estate via the Dorset Record Office.)

Price, C.A : Professor of conservation at University College London, lecture and conversations at Bournemouth c.1995. (Contact via University College London, Gower Street, London, WC1E 6BT.)

Radiologists at South Dorset NHS Trust : The radiology department at Swanage Hospital were contacted to get the most recent medical opinion on safety of x-rays. Staff were reasonably happy to offer the opinions noted in Chapter 9, but wished to remain anonymous. Contact 2001. (Specifically requested that they should not be contacted.)

Rahtz, Philip : Archaeologist. Participated in a seminar organised jointly by SPAB and the Council for British Archaeology to explore the conflicts between buildings archaeology and building conservation. It was held at King's Manor, York in around 1990. (Contact via York University, The King's Manor, York, YO1 7EP.)

Ratcliffe, T. : Tim Ratcliffe, architect in private practice specialising in historic building repair. Numerous informal conversations from 1980s to the present day. (Contact via SPAB, 37, Spital Square, London, E1 6DY.)

Rodwell, W. **:** Archaeologist specialising in standing buildings, phone conversation, c.1990. (Contact via <wjr@warwickrodwell.com>.)

Rolt, Sonia : Chairperson of the SPAB Education Committee, and a lifelong student of the art of ancient buildings. (Contact via SPAB, 37, Spital Square, London, E1 6DY.)

Sampson, J. : Conservator and archivist to the Wells West Front conservation project, numerous conversations, 1982 onwards. (Contact via Caroe and Partners, Penniless Porch, Wells, Somerset.)

Sapouna, S. : Student on Architectural Materials Conservation MA at Bournemouth University, 1996-7, now working on historic monuments for the Greek Ministry of Culture. (Contact via Bournemouth University, School of Conservation Sciences, Poole, Dorset, BH12 5BB..)

Schofield, J. : Historic building consultant with Architecton architects. Numerous informal conversations on all aspects of church architecture and repair from 1980s to the present day. (Contact via Architecton, The Wool Hall, 12 St. Thomas Street, Bristol, BS1 6JJ.)

Sinclair, Eddie : Paint conservator in private practise, who conducted a major survey of the paint traces remaining on the West Front of Exeter Cathedral. (Contact via <eddie@sinclair-polychromy.co.uk >.)

Sumner, Heywood : 1853-1840. "A member of the British Arts and Crafts group with a particular fondness for history and its impact on the environment. He developed from a rather embarrassing admiration for William Blake, to a straightforward and deceptively drawn illustrative style. One saving grace was an early identification with the archaelogical exactitudes of legends and myth. In his drawings for The New Forest and Stonehenge , he achieves a real sense of place, and a decorative drawing style that sits well with the need to record what is there. At his best he can achieve the true intimacy of Edward Calvert with heavy rhythmic lines." <www.fulltable.com/vts/aoi/s/**sumner**/s.htm>

Thomas, Dr. Jo., : Dorset based geologist who has done considerable field work in the county linking archaeology and geology. (Contact via DNHAS, Dorset County Museum, High West Street Dorchester Dorset DT1 1XA.)

Thompson, Dr. M. : Technical director of the Chemical Lime Company, Las Vegas, Arizona. Produces and has great faith in the technical performance of Chemstar-S a Dolomitic stone based lime. There are no recorded examples of its use in this country. It is produced by pressure hydration and should probably only be compared to medieval limes with the greatest of caution. (Contact via <lhoist.com>.)

Venning, P. : Current secretary of the SPAB. Source of much information on the early history of the SPAB. (Contact via SPAB, 37, Spital Square, London, E1 6DY.)

Watts, Revd. W. : Rector of Studland, source of much detail on the financial and political affairs of the Church of England in Dorset. (Contact via The Vicarage, Studland Dorset.)

Wilmot, S. : Joint director of The Compendium Practice. Building surveyor specialising in measured and drawn surveys of historic buildings. He reports significant accuracy problems when using a state of the art Leica reflectorless total station theodolite on behalf of the National Trust on the Temple of Apollo at Stourhead in 2003-4. The nature of problems was complex and not fully relevant to the profiling of plaster, but they remain unresolved. (Contact via Bournemouth University, School of Conservation Sciences, Poole, Dorset, BH12 5BB.)

White, Pam : Education officer for the National Trust at Corfe Castle. Has specialised in analysis of the Exchequer Rolls re. lime used for building of Corfe Castle. Numerous informal conversations from 1990's to the present day. (Contact via .)

Wingate, Michael : Architect, now an English Heritage inspector. One of this country's leading experts on all aspects of the chemistry and use of lime. Has provided immense indirect technical support to this project. (Contact via SPAB, 37, Spital Square, London, E1 6DY.)

Young, Rory : Contractor and sculptor, specialising in lime work. Numerous informal conversations from 1980's to the present day. (Contact via SPAB, 37, Spital Square, London, E1 6DY.)

13.4 Manufacturers websites

Airmar : <www.airmar.com>
Eagle : <www.eaglegps.com>
Garmin : <www.garmin.com>
Ultran : <www.ultrangroup.com>

13.5 Glossary

Amenity societies : Five voluntary societies that have received government recognition as advisors to local authorities on listed building planning applications. They also advise central government on heritage issues via a joint committee. It is uncertain how influential this advice is in practice, and the assumption that the five societies share any common knowledge base or philosophy is open to challenge. The Societies are : SPAB, The Georgian Group, The Ancient Monuments Society, The Twentieth Century Society, The Victorian Society and The Council For British Archaeology.

Arris : The angle where two faces of a stone meet.

ASCHB : Association for the Study of Conservation of Historic Buildings.

Blu-tak : trade name for a patent recipe, low bond strength, putty like adhesive. Its ingredients are not known, but do contain oils that have been observed to cause staining on permeable surfaces such as plaster and limewash.

CADW : See English Heritage.

Cames : Lead strips, 'H' shaped in cross section used to hold and secure the individual pieces of glass in leaded light or stained glass window.

Carbonation : The process whereby carbon dioxide in the atmosphere reacts with calcium hydroxide (lime) to give a permanent chemical set. Moisture is needed for the reaction to occur. The proportion of carbon dioxide in the atmosphere is relatively small (<400 ppm) and very large volumes of atmosphere have to contact placed lime mortar for the carbonation process to complete. On even small structures this likely to take many years. Data from the concrete industry shows that the carbonation of free lime in OPC based concrete can progress fairly rapidly, but it is uncertain how far this behaviour is relevant to medieval structures and mixes. There is informed speculation that autogenous healing abilities of non-hydraulic lime mortars are due to individual lime particles carbonating on their surface but not within their core. This is a complex area of chemistry/physics, and much research remains to be undertaken.

CCC : *See Council for the Care of Churches*

Chantry chapels, Chantries : Buildings, or structures with churches, erected by an individual parishioner, containing a private altar at which prayers would said on behalf of the owner and his family. Many were provided with an endowment for the retention of a private priest, and were effectively churches within churches.

Council for the Care of Churches : London based body set up and funded by the Church of England to give advice to parishes on the upkeep of parish churches. It maintains a voluntary and informal library of conservation reports. Its role is advisory. It is independent of government funded heritage organisations and other amenity societies *(see above)* such as SPAB

Cresset Stone : Stone bracket set into a wall to carry a candle or lamp.

Crown glass : The most commonly used form of pre-nineteenth century window glass. Made by taking semi-molten glass from the furnace on the end of a long straight metal rod and spinning the rod so that centrifugal force turns the semi-molten glass into a flattish disc. Small diamond shaped quarries represent the most economical way of using crown glass.

DAC(s) : *See Diocesan Advisory Committee(s).*

Daub(s) : Clay based renders and plasters. Often said to contain cow-dung and certainly sometimes mixed with lime. They appear to have been in use in all low-status building work from the ancient world onwards. This survey has not sought to create a typology of the materials used in Dorset churches, but has found no evidence of daubs used on Dorset churches. *See also mortars, renders and plasters.*

Deep pointing : A technique for the consolidation of ruins developed by the Ministry of Works in the early years of the 20th century. Its success is open to question, since it has proved less durable than its creators had hoped, and usually involved the complete destruction of any surviving wall plaster.

Diocesan Advisory Committee(s) : Groups of lay advisors and clergy, normally with members from an Amenity Society and English Heritage. They provide technical advice on building related matters to the archdeacon of each diocese.

DNHAS : Dorset Natural History and Archaeological Society.

Dolomite : Naturally occurring rock which is a mixture of approximately 60% calcium carbonate and 40% magnesium carbonate. Used a building stone in much of Yorkshire and north Nottinghamshire. (for example,. York Minster) It has very distinctive and problematic decay patterns. It appears to have also been widely used as source material for lime making. There have been suggestions that it is harder make reliable limes from magnesian limestones *(Holmes and Wingate, 1997, p.15),* but this is not an area that has been convincingly researched.

Drag, Dragging : A drag is a tooted blade, often a broken fragment of a saw blade, used to flatten or clean a masonry surface.

Drip courses : common medieval masonry detail. A horizontal band of projecting carved masonry designed to shed water from the surface of a building. Their effectiveness is open to discussion. Where they form pronounced architectural design features they are also known as string courses.

DRO : Dorset Record Office.

English Heritage : Formerly an arm of The Ministry of Public Building and Works. Now a quango charged with administering many of the aspects built heritage. It is a complex organisation with many different roles, outside the scope of this definition. Parallel bodies exist in Scotland (Historic Scotland), Wales (CADW) and Northern Ireland (NI Office of Works). All are nominally independent, but in practise are tightly financially controlled by government departments.

Eurolime : an agency funded by the European Union, and based at the University of Karlesruhe, to develop the use of building limes in the repair of historic buildings in Europe. It operated during the 1980s and 1990s, but is now dormant. The English Heritage Smeaton project was developed as contribution to the Eurolime project.

Faculty (Diocesan) : a formal permission granted by a bishop (actual decision often delegated to an archdeacon) to allow changes to existing church fabric or the construction of new churches. Faculties are one of the main tools used by documentary researchers to establish the date of churches fabric. Wide discrepancies have arisen between the work specified and the actual work as built.

Feather edging : a plastering technique where the thickness of the plaster layer is reduced towards its edges so that a seamless and stepless junction can be achieved between the plaster surface and adjacent carved detail. It is only generally possible when lime mortars with fine aggregate are used for the plaster. It has not been regarded as good practice since Victorian times, and is usually a reliable sign that plaster is medieval.

Freestone : Any stone, regardless of geological origin that can be worked with equal ease on any axis.

Full pointing : very generous filling of the joints between masonry units, so that a unified surface is created and the mortar and masonry appear as one.

Gauging : mixing materials in accurate proportions. Traditionally done by volume with materials for mortars. Sand, lime and other materials were measured out using wooden gauging boxes.

Harl, harling : Scottish term for roughcast rendering or exterior plastering. Always applied by throwing the mortar onto the surface rather than applying it with a tool. Typically contains very large aggregate grains and has a highly textured surface.

High calcium lime : Building lime (calcium hydroxide) or quicklime (calcium oxide) containing little silica or alumina and therefore non-hydraulic. Also used to differentiate ordinary lime from Dolomitic (magnesian) lime.

Historic Scotland : See English Heritage.

Hopper head : Traditional feature at the head of a rain water down-pipe. They break the suction that might be created between down-pipes and other plumbing, and can serve as a safe overflow point for blocked down-pipes.

Laitence : Term used by the the concrete industry to describe the layer of binder-rich material that develops on the surface of mortar, plaster or concrete that has been badly cured. It is caused by the migration of the finer particles in the mix, usually cement or lime, towards the surface from which the plasticising water is being lost most quickly.

Laths : On walls : thin strips of timber nailed in parallel, horizontal rows to studwork to act as a supporting frame for plaster. On ceilings laths are nailed to joists in parallel rows. In both cases the gap between each row allows wet plaster to be forced through and form a key that holds the plaster in place.

Leaded light(s) : A system of glazing windows that has been in used in Britain since at least Roman times. Early glass making was only able to produce small pieces of glass. Each small piece was set into a lattice of 'H' section lead strips known as cames. The lead to glass joint was sealed with pitch. The whole assembly was usually fairly rigid (at least when new) but relied on iron stanchions and saddle bars for structural integrity.

Lime fast pigments : Where lime is used a binder for paint, this inevitable gives the paint a high pH. Such an alkaline environment degrades the colour in many pigments. Blues and greens are particularly susceptible and can quickly turn grey. Lime fast pigments resist this alkaline attack.

Magnesian Limestone, magnesian lime, Dolomitic lime : See Dolomite.

Mortar, plaster and render : Any blend of binder, aggregate and additives placed between structural elements of a building or used to coat the surface of walls, floors or ceilings. Render tends to be applied to outdoor work, though the three terms are often fairly loosely interchanged in the conservation and building industries. It is the end use rather than the constituents that define each category, though since the end of the nineteenth century, the word plaster has come to be specifically applied to mixes bound with Gypsum. *See also Daubs.*

Ministry of Works : Now split into English Heritage, Historic Scotland or CADW. Formerly the government agency charged with care of historic monuments.

NADFAS : The National Association of Decorative and Fine Art Societies. Has organised an ongoing national survey of church furnishings and art. Though invaluable as a catalogue of important material, it is not technical in its orientation. In other words, it is very much concerned with wall paintings, but not at all with the walls that carry them.

NCU, Non-contact ultrasound **:** . A system being commercially developed by the Ultran Group (and possibly others) that uses a very high output transmitting transducer to allow ultrasound investigation of a material without the need for the transducers to contact the surface of the material.

NDT , Non-destructive testing : A generic label for a wide range of investigative and imaging technologies, whose only common feature is that the specimen being tested is not damaged by the testing process. These technologies include X-ray, Radar, Ultra sound, Magnetic resonance, and optical techniques such as laproscopy.

Overskim : This word has been given a special significance within the context of this thesis. It is specifically used to denote a layer (or layers) of plaster that have been applied over medieval plaster, without the significant modification of that medieval plaster.

Patent cement : Before Ordinary Portland Cement became the dominant binder for mortars, a range of hydraulic limes were in use, for example,. Roman Cement, Medway or Medina Cements *(See Pasely, C.W., 1997)*

Perlite : pea sized granules of expanded (partially foamed) clay produced by a patent process. In common use in horticulture as a potting medium. Used in the fishfinder trials in chapter 10 because of its low density.

Pozzolan , Pozzolana : Any material that causes lime to set by relatively rapid internal chemical reaction as opposed to a slow set by external carbonation. Most fired clay (silica) materials have a pozzolanic potential. The English Heritage Smeaton Project has produced evidence that crush brick is particularly useful as a pozzolanic additive.

Quarries : Small diamond shaped pieces of glass used to form the traditional leaded light window.

RIBA : Royal Institute of British Architects. Maintains an extensive library at its London Headquarters.

Roman cement : Neither Roman nor cement. A natural cement used widely in the eighteenth and nineteenth centuries. Based on kilning septaria nodules which are natural mixtures of clay and lime. Sets very quickly. Has a distinctive dark brown colour. See Sickles, L.B.,1987, and Swan, S., 1996, for more detail.

Restoration : A hard to define word with many shades of meaning. Those in favour of restoring buildings take it to me putting right all the damage done in the past and 'restoring the former glory'. Critics, such as the SPAB, say that most restoration does not recreate a lost reality, but destroys what little does remain whilst inventing a false pastiche of the past.

Royal peculiars : parts of churches directly owned and maintained by the monarch, such as the chancel at Colaton Raleigh, Devon.

Run of kiln material : Bonfire or clamp kilns appear to have been the normal method of lime production in early medieval England. Coal or wood fired vertical shaft kilns (sometimes known as flare kilns) became the standard means of producing quicklime from the later medieval period till well into the middle of the twentieth century. In both types of kiln the fuel is mixed and burnt in with the raw limestone. If the kiln is well controlled and the fuel has few impurities, this process yields pure quicklime. However, poor control and impure fuel give rise to considerable residues in the finished product. These are general known as run-of-kiln material. They can act as powerful *pozzolanas.*

Run out : see feather edging.

Scrapes : small areas of plaster or paint removed to reveal lower surfaces or take samples of paint or plaster. *(See also windows).*

SPAB : The Society for The Protection of Ancient Buildings. Founded in 1877 by, amongst others, William Morris, it has campaigned to prevent the restoration of buildings as opposed to their repair. On a case by case basis its early influence was mixed, with notable failures at Tewkesbury, Lichfield and Westminster Abbey. In a more general way its influence has been considerable on bodies such as the National Trust, The Ministry of Works and English Heritage. Internationally, SPAB ideas underpin many of the international charters (for example,. Athens or Burra) that are current in conservation.

SPAB Technical Panel : Sub-group of the main Society meeting once a month to give technical support to Society officers and the main committee. This author is a member.

Stop, stops, plaster stops : Describes the detailed shape of the edge of a layer of plaster. (See above feather-edging. The Victorian restorers penchant for thick layers of plaster formed using hard and brittle mixes transformed the medieval stop detail the feather-edge into a hard moulded step.

Studwork : (In the context of this thesis) Timber framing attached to the inside surface of a masonry wall to act as a support for lath and plaster.

Texts : During the seventeenth century it became commonplace to decorate church walls with painted texts. These are commonly verses from psalms or from the bible. The Ten Commandments were a very popular choice. Usually painted in black on a plain plaster background, they appear to have been commonly applied over limewash which is covering a medieval plaster surface. It is uncertain how far the presence of post medieval painted texts can be used to infer the presence of underlying medieval plaster.

Tithe : a local church administered tax, whose revenue went to the holder of the living. Often paid in kind with agricultural produce, hence the building of ecclesiastical tithe barns to store the revenue yielded by the tax.

VCH : Victoria County History. Series of county by county monographs drawing together many diverse sources of primary evidence to provide a general geography/history up to the early part of the twentieth century.

Windows : In wall painting conservation, small (usually 50-75 mm. square) areas of excavation where upper layers of paint or plaster are removed. The technique was in common and unchallenged use until the end of the 1980's when worries started to be voiced among conservators that the practice was destructive and therefore unethical. The attempt by this project to trial cheap non-destructive survey techniques is, in part, a response to these worries. *(See also scrapes.)*

14. Appendices.

14.1 Details of fishfinder trials

14.1.1 Choice of equipment.

As noted in chapter 10, the choice of sonar equipment was based on a market survey of what was available. Cost was a significant factor. The unit chosen is aimed at the sport fishing market. Units designed for commercial fishermen, are much more costly at around £750 upwards. The reasons for this are not clear, since the published specifications for either type do not appear to be very different. It is possible that commercial units are more physically robust. More significantly, it is possible that the software instabilities noted below do not affect the more expensive units.

Other equipment, such as tanks, pipes, sample mortars etc., were all standard commercially available products.

14.1.2 Presentation of the data

The results of the two trials are presented as photographs of the data presented on the fishfinder screen. The quality of these photographs is not perfect, but was the best that could be achieved with the available equipment. For future research, a method of directly downloading data from the fishfinder to a computer would be a major improvement.

14.1.3 Tank trial

14.1.3.1 Aims

The aim of the trial was decidedly humble : to discover whether fishfinding sonar could be induced to discriminated between plaster layers submerged in a water environment.

There was little initial confidence that any data could be obtained.

14.1.3.2 Trial design

A trial environment was first created :

i A forty litre polypropylene water tank was sited on stone flagged yard surface and filled with tap water. A timber bridge was constructed across the tank from which the sonar transducer was suspended so that it was completely immersed in the water in the tank.

ii Three plastic (ABS) thin walled seed trays were filled with sample mortar which was allowed to cure for three weeks. (See below).

iii The fishfinder unit was connected to a 12 volt car battery, and both were mounted indoors at short distance from the test tank.

iv A digital camera was used to capture the results displayed on the fishfinder screen.

Mortars were mixed as follows :

Sample 1 - Ordinary Portland Cement : sharp sand (ratio 1:3).

Sample 2 - OPC : Non-hydraulic lime : Perlite (ratio 1:3:12)

Sample 3 - Non-hydraulic lime : sharp sand (ratio 1:3)

Mortars were designed to possess the following attributes :

Sample 1 - To closely resemble the density and general character of the plaster mixes used by Victorian restorers for their overskims.

Sample 2 - To approximate to the low density, low purity lime mortars used by medieval lime plasterers.

Sample 3 - To approximate to the denser and purer lime mortars used in the post medieval period.

Figure 74
The test tank.

Figure 75
The test tank with three mortar samples installed. The white material at the bottom of the tank is a very thin layer of dust washed from the surface of the samples. It is not thought to have interfered with the trial results. The role played by the bottom of the tank, and the yard surface below it, is unclear and need further research.

Figure 76
The transducer in place above the mortar samples. It is held by a simple wooded bridge above the water.

Figure 77
One of the seed trays used to cast the mortar samples.

Figure 78
The three mortar samples :
top : OPC and sand (1:3)
middle : OPC, lime and Perlite (1:1:6)
bottom : Lime and sand (1:3)

The aim was to produce as wide a variation in density between the samples as possible, so that ultra-sound would be more likely to discriminate between them.

14.1.3.3 Calibration

Given that no reference data of any sort was available, the first task was to calibrate the equipment. This involved learning the basic functions of each control and researching the effects that control adjustments had on the data produced by the display. This process was hampered by the vary basic nature of the instructional literature supplied with the unit. As noted in Chapter 9.9, much of the software that has been developed for medical and industrial ultra-sound applications is designed to filter-out noise. Noise is unwanted sonar return that obscures the returns that contain useful data. The controls offered on fishfinders mainly appear to be noise filters, but they are unfortunately given unscientific names in manufacturers literature . It would have have made trial much easier if comprehensive and detailed information on the function of software controls had been available.

The following pages describe the information gained by the calibration process, and then show and discuss the results of the tank trials.

14.1.3.4 : Interpretation of the results.

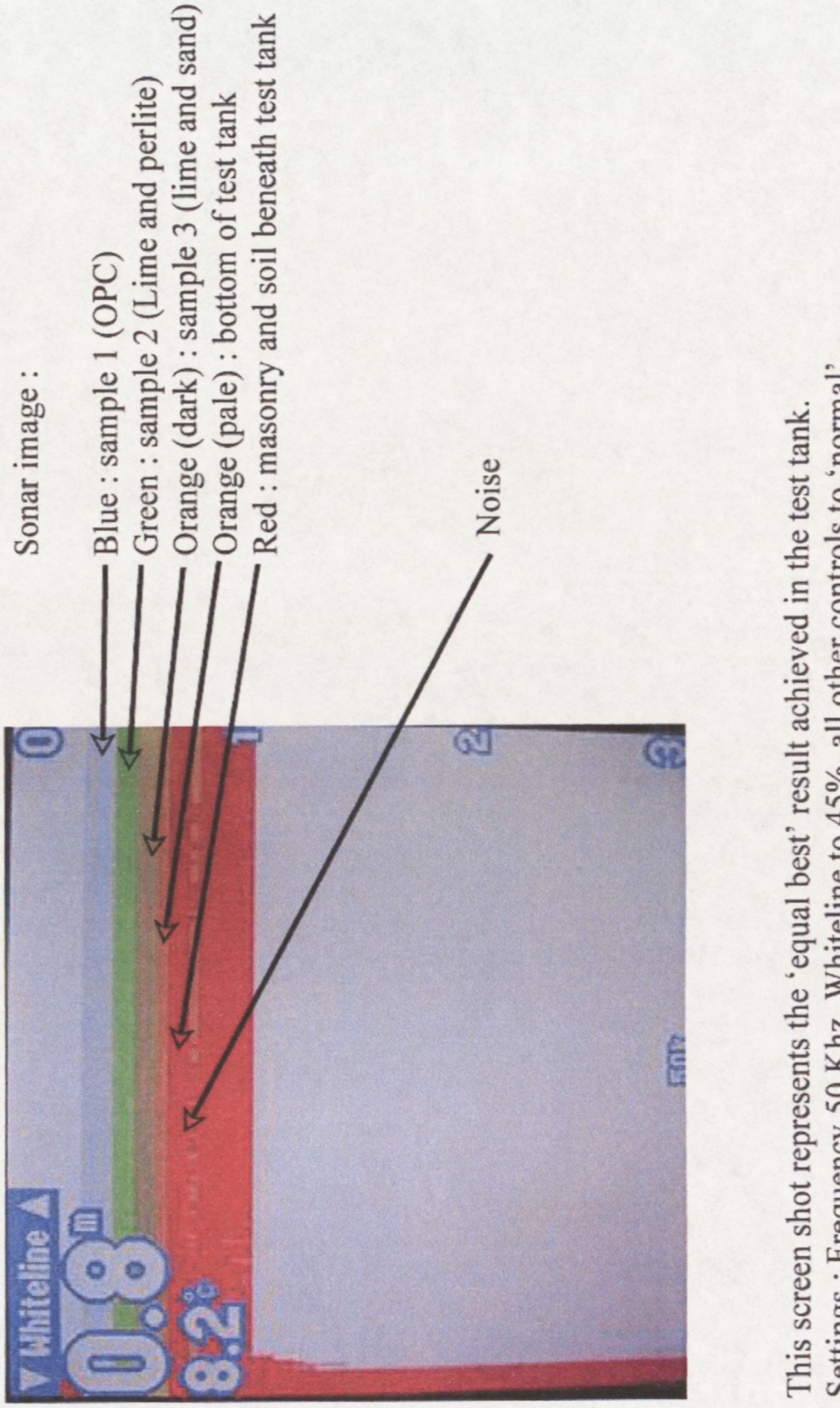


Figure 79
Results from the test tank.
A possible interpretation of the screen display is given above. It must be stressed that the trial results are tentative, and the above results are not a proven interpretation.

14.1.4 Pipe trial

14.1.4.1 Pipe trial equipment.

The pipe trial was conducted in a broadly similar way to the tank trial, the aim being to replicate the results with a potentially mobile piece of equipment. As with the tank trial all the equipment was standard, commercially available and not specially modified in any way.

Materials used :

i *Lead* : Code 5 milled lead.

ii *Bubble wrap* : standard postal bubble wrap with small (c.5mm.) bubbles.

iii *Mortar* : mixes as in trial one :

Sample 1 - Ordinary Portland Cement : sharp sand (ratio 1:3)

Sample 2 - OPC : Non-hydraulic lime : Perlite (ratio 1:3:12)

The mortar samples were mixed and placed separately, so that sample two was able to cure before sample one was place on top of it. The aim here being to replicate the secco bond created when early plaster was overskimmed by Victorian restorers. *(See Chapter 4.)*

The more dense and harder sample (sample one) was placed above (that is, nearest to the transducer) sample two, again to replicate the actual conditions likely to be found in the field.

Figure 80
The test pipe was standard 100mm. extruded PVC soil pipe with standard fitting and connectors. The assembly had an overall length of 600mm. This allowed the transducer to be positioned 400mm. away from the surface of the sample.

Figure 81
The lower part of the tube, containing the test sample, is connected to the upper part with a standard rubber drain connector. The purpose of the joint was to allow easy access to cast the sample.
The bubble wrap, lead discs and two layers of mortar samples are positioned in the lower part of the pipe, below the rubber connector.
The transducer can just be seen, in place, resting in the widened section at the top of the tube.

Figure 82
Bubble wrap and a lead disk were placed under the mortar samples in attempt to absorb stray ultra-sound echoes from the end of the pipe.

Figure 83
The bubble wrap installed prior to the placing of the lead and the mortar samples.

14.1.4.2 Pipe trial results.

The pipe trial return results broadly in line with those of the tank trial. The following screen shot is typical :

Figure 84

In other words, the equipment appears to discriminate between the two samples (the blue and green layers), but the trial cannot be regarded as conclusive.

14.2 Paint

Whilst this project is not primarily concerned with the painted layer on the plaster, but rather with the plaster itself, medieval wall painting techniques have had a major impact on the survival of plaster.

During the medieval period, most churches underwent periodic redecoration. Obviously where restorers stripped plaster all evidence of this process has been lost, but surviving physical evidence suggests that little or no attempt was made to remove existing plaster or paint before fresh layers were added. Some surfaces at Inglesham church in Wiltshire are reputed to have up to 20 successive layers of lime decoration *(Schofield, J., 1984-1987, pers.coms.).* The more that overlaid decorative schemes are built up, the greater the risk of complete failure and loss of all the layers, including the supporting plaster. This is partly due simply to the weight of the accreted layers, but also due to the nature of the paint itself. To understand this it is necessary to look in some detail at the nature of materials used in medieval mural painting.

14.2.1 Media used in medieval painting.

Medieval mural painting shares many of the materials and techniques of contemporary easel painting, in that all paints contain the following groups of materials :

14.2.2 Binder.

Most medieval mural paintings use lime as a binder to hold the other materials to each other and to the substrate. However, not all pigments are lime-fast, and blues and greens in particular could not be bound using lime. Proteins such as egg white were used as binder where these colours were needed. *(Gettens, and Stout, 1966, pp. 3-88.)*

14.2.3 Pigment

Mural paintings are obviously on a far larger scale than easel paintings and in most Dorset parish churches were created for relatively poor clients. These two factors imposed severe economic constraints on the artists. Pigment was, and is, the most expensive part of any paint, yet it was not possible to do without it, as paint by definition demands colour. The medieval response was to employ, whenever possible, the cheapest pigments available. These are from the earth colour family. They are all based on hydrated iron oxide and range from light pink, to rich red, through all shades of yellow to dark brown. All are lime-fast *(see glossary)*. In high status work, other pigments with better colouring power (the ability to provide tone, hue and opacity without undue bulk) were widely used. Extensive survey work at Wells, Exeter and Salisbury Cathedrals has revealed substantial remains of extensive colour schemes. These used a wide variety of pigments *(Sampson J., 1998, passim, and Sampson J., 1982-1983, pers.coms.)*. Even lime-fast pigments can be very colour unstable. Ultra-violet light degrades most pigments and oxygen can attack many others. Yet others are simply dissolved and removed by damp and condensation. Biological activity may also play a part in pigment change and loss. (*Gettens and Stout, 1966, pp.91-181.)*

14.2.4 Filler

Apart from lime based paints, where it is not necessary, many paints are filled with an inert substance (such as crushed chalk) simply to give them bulk at low cost. From the surviving evidence, most Dorset churches appear to have used lime based paints, so issues relating to the use of filler are unlikely to have arisen.

14.2.5 Extender

Extenders are translucent materials that modify the optical properties of the paint layer. Lime based paints are already highly translucent, because of the optical properties of lime itself, so that extenders are unlikely to have been added to the paints used in Dorset Churches.

14.2.6 Paint, water movement and adhesion problems

The composition of paint is directly relevant to this project because most (if not all) of Dorset's medieval churches were not only plastered but painted. *(See chapter 2.)(Sampson J., 1998, passim, and Sampson J., 1982-1983, pers.coms.)*. An important reason why so little plaster survives is the nature of the plaster itself, and of the paint upon it. Water movement, together with soluble salt crystallisation are two of the most destructive forces acting on buildings. Anything which disrupts the evaporation of water from damp walls is likely to cause significant damage. Many of the materials used to bind, pigment and extend mural paint are likely to modify the way water will move through and behind the paint layer. In particular, organic protein binders are likely to somewhat restrict the movement of water.*(See Chapter 14.6.4)*. When paint that restricts water movement is applied to plaster that has been overworked to make a good surface for decoration, water driven failure becomes much more likely. *(See Chapter 14.6.4)*. In other words, painted decoration is likely to have contributed to the loss of much Dorset church plaster.

14.3 Reports from the Dorset County Chronicle

This is reproduced from microfiche held in the Dorset County Record Office. Poor quality is due to the poor quality of the microfiche slides. This report is typical of the many thousands that require further research. Not many are as brief and well focused on church building issues. Taken from the Dorset County Chronicle for September 16th. 1840.

CONSECRATION OF THE NEW CHURCH AT WINTERBORNE CLENSTON.

DCC 16 Sep 40

The Lord Bishop of Salisbury arrived at Whatcombe House, the seat of Mrs. Michel, on the evening of Monday last, in order to consecrate, on Tuesday morning, the New Church, just erected in the village of Winterborne Clenston, at the expense of Mrs. Michel, whose munificent devotion to the temporal and eternal interests of the villagers in her neighbourhood, is unremitted and worthy of all praise. Not only has she erected this church, and founded a school at Winterborne Whitchurch, but she is also now engaged in founding schools in other villages on her estates, thus appropriating her talents to the service of that God who has bestowed them, and evincing a due sense of the scriptural injunction, that from them to whom much is given shall much be required. The imposing ceremony of consecration was attended by a very great number of the clergy and gentry of the neighbourhood, and a large assemblage of inhabitants of all classes, who were deeply interested in the proceedings. The church is a very elegant structure in the early Gothic style, with pointed windows of single lights and graceful headings in the form of a Latin cross, with a stone spire, that characteristic, but in this county, uncommon ornament of our Ecclesiastical Architecture. Over the entrance, in an ornamented niche, are sculptured in high relief the figurative armour of the Christian soldier—a novel, and, as it struck us a beautifully adapted symbol for a Christian Church. In the south transept, on a tablet of black marble, are the leaves of an open book in white marble, upon one page of which is an inscription to the memory of the late Rev. James Michel, and the opposite page remains blank, to be hereafter filled, (and for the sake of her friends and neighbours of every class, we hope at some distant period), with the memorial of his widow. There was a great number of persons of every class collected to witness the ceremony and the whole church, and a great part of the church-yard were crowded, wherever standing room could be found. After the usual preliminaries and the reading of the sentence of Consecration, in which the sole bounty of Mrs. Margaretta Michel was duly commemorated, the service of the day was read by the Rev. George Frome, Incumbent of Clenston; the Right Rev. the Bishop, and the Ven. the Archdeacon officiating at the Altar. A beautiful original and appropriate hymn was then correctly and sweetly sung by the Miss Fromes, with professional assistance; after which the Bishop preached a most impressive Sermon on Mark xiv. 8. "She hath done what she could," in which the duty of Christian liberality was most searchingly enforced.

Amongst the company we observed Col. and Mrs. Mansel and family, Rev. G. Snow and family, Major, Mrs. and Miss Michel, Mrs. Smith, of Sydling, Mrs. Curtis Smith, Miss Yea, Capt. and Mrs. Donaldson and family, Dr. Lees, Miss Luttrell, Miss Hawkins; Revs. Messrs. J. Estridge (Curate), Templeman, E. Stuart, Watts, R. Farquharson, C. W. Bingham, Colson, Dansey, Bellamy, P. Still, P. Smith, St. John, Churchill, Acton, Tyrwhitt, Duke, Wilkinson, Shirley, &c. &c., many of whom afterwards partook of an elegant luncheon, at Whatcombe House; and few could there have been who did not go away, with their hearts warmed by the delightful services of the day, and gladdened by the reflections which the observation of wealth, wisely and worthily applied in the service of our heavenly master, cannot fail to awaken.

We have been favoured with a copy of the hymn; and also a few, descriptive verses; the publication of which we must defer until our next.

14.4 Accidental discovery of painted plaster.

Included below are two randomly chosen examples of newspaper reports of accidental wall painting discovery. Such reports are an irregular but not a rare occurrence.

From The East Anglian Daily Times, August 5th., 2002.

East Anglian Daily Times, Monday, August 5, 2002 **www.eadt.co.uk**

Repairs at church uncover medieval pigments

Work halts for experts

By David Green

PAINTED medieval wall decorations have been found in one of East Anglia's smallest churches.

Fragments were discovered as volunteers from the Society for the Protection of Ancient Buildings (SPAB) carried out maintenance and decoration work at the 16th Century Southolt Church, near Eye.

The internal decoration of much of the interior has been halted while experts assess the extent of the medieval decorations and their importance.

"We were taking off the crumbling layers of plaster and limewash near the windows when the areas of pigment were seen. It is a very exciting find," said Douglas Kent, who is leading the second annual SPAB work party at the church.

The volunteers, who are also improving the roof drainage system, are staying with residents who also provide them with meals.

The village has a population of only 40 adults who are struggling to find the money for maintenance and repairs.

The church was acquired by the villagers seven years ago after two decades of legal wrangling sparked by a diocesan decision to put it up for sale.

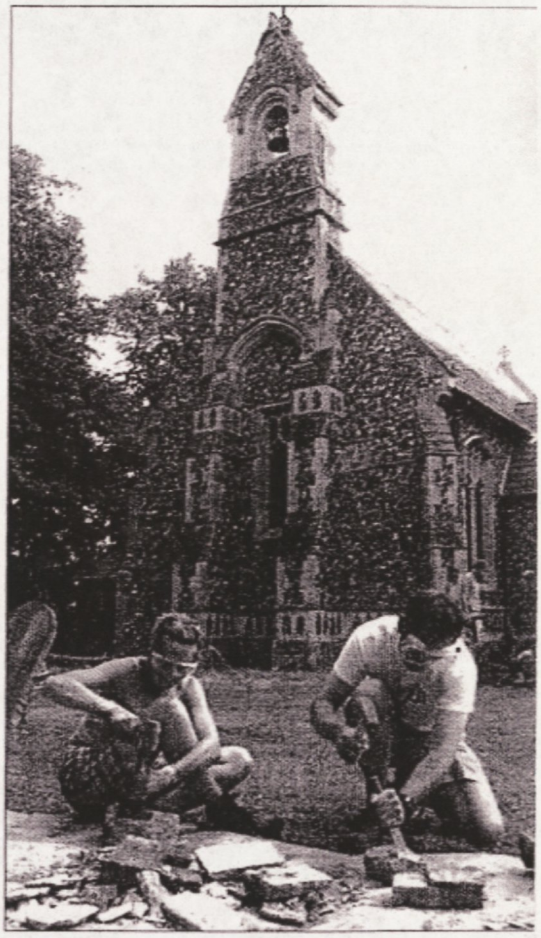
The trustees of the church use income from a local trust and significant donations from local families to try to keep the wind and the rain out of the building, which is used for religious services just a few times each year.

SPAB was set up by William Morris in 1877 to counteract the destructive restoration of medieval buildings by Victorian architects.

Mr Kent said: "The Victorians caused a lot of damage in trying to repair ancient buildings using the wrong techniques and materials, and subsequent generations have been left to pick up the bill, as here at Southolt.

"It is important that old buildings are allowed to breathe and that water drains away from the exterior walls. Otherwise they become damp and structural problems arise."

More than a dozen SPAB members, from all over the country, including a qualified architect, are spending a week in Southolt as part of their annual holidays.



EXCITING FIND: Jo Hibbert and Douglas Kent working at Southolt Church, above, **and** right, **Sem Oran inspects some pigment** Photos: JAMIE NIBLOCK

The organisation gives advice on sympathetic restoration techniques to builders, architects and home-owners, holds training courses and acts as a consultant in the planning process when proposals are put forward for repairs or alterations to ancient buildings. It has instrumental in saving thous of buildings. It can be contact 37 Spital Square, London, E1 tel 0207 377 1644.

david.green@eadt

14.4 Accidental discovery of painted plaster, continued.

From The Church Times, 17.4.98, page 28.

Pamela Tudor-Craig **reports on a pioneering survey of wall-painting at Worcester Cathedral**

Traces of paint, clues to the past

IN THE MID-1970s, the group concerned with the conservation of the crumbling sculptures on the west front of Wells Cathedral was surprised to discover significant traces of original colour on or around the 13th-century figures. There were flesh tints on the faces of the virgin martyrs, and patterns on their robes. A tiny blob of brown paint on the cheek of one of the knights identified him as the African St Maurice, and by extension the group of whom he is one as the eight knights of Christ.

It was the policy, directed by Professor Robert Baker, not to shelter-coat over original paint, since it was still protecting the stone beneath it. It became one of the duties of the conservators to plot surviving paint on the diagrams of the figures for which they were responsible. Ashrok Roy of the National Gallery made a scientific examination of the central group of the coronation of the Virgin, finding translucent layers of paint and the use of gold leaf, and establishing that oil was the medium used. Oil is now found everywhere in English painting from the 12th century.

When we turned to Exeter, where substantial quantities of the post-Reformation red repainting were still evident, Edie Sinclair was given from the beginning a brief to record colour, and, with the help of Exeter University's laboratory, to analyse it. She discovered many medieval layers of repainting.

Nevertheless, our responsibility to record all traces of medieval paint outside and inside our medieval cathedrals has only recently been fully accepted as an important part of our understanding of the whole. The Conservation of Wall Paintings Department at the Courtauld Institute has carried out a relatively brief survey of the surviving wall paintings in Winchester Cathedral. However, the first full-dress examination of the medieval paint surviving inside an English cathedral was commissioned from this department by the Friends of Worcester Cathedral in 1994, and completed in November 1997.

Why Worcester, you may well ask, when more material visibly survives at St Albans or Durham, Canterbury or Exeter? Worcester was thoroughly scrubbed by Gilbert Scott. Was there anything of interest to record? The answer is a firm Yes. We have much reason to thank Philip Barker, just retired from the post of the cathedral's consultant archaeologist, and the present archaeologist, Chris Guy, aided and abetted by the clerk of the works and the cathedral librarian. David Park and Sharon Cather of the Courtauld, with nine of their students, have had technical and art-historical help from Helen Howards and Ioanna Kakoulli, and scientific advice from Ashrok Roy. The result is a pioneer report which makes absorbing reading.

The earliest wall paintings in the cathedral are simple masonry lines, emphasising the architectural forms of St Wulfstan's late-11th-century crypt. Late-12th-century masonry patterns overlay the decorative effect of contrasting bands of stone, a white limestone and a green sandstone counter-changed. That fashion, which only flourished for a generation until about 1100, can still be seen in the Little Cloister at Westminster Abbey. At Worcester, a simple column on the south side of the triforium is enlivened by a spiral pattern, and a fat 12th-century roll moulding.

One of the most extensive areas of surviving wall painting at Worcester is in the south-east chapel of Wulfstan's crypt, an area established soon after 1200 and abandoned before the middle of the century. The dado was treated with masonry patterns, scattered with stencilled rosettes, all in simple red ochre on white. In 1860 a figure of a censing angel from a window splay was found and traced. Then, in 1986-7, an exquisitely modelled face, corresponding in scale to the traced angel, and a fragment of a Lombardic inscription of typically 13th-century type, were found. So the splays of this window, doubtless the eastern opening of this short-lived chapel, were ornamented by two angels of high quality. The head on its own could not have told the whole story, but, as throughout this model report, David Park and Sharon Cather have enlisted related material and thereby greatly enhanced our understanding of what remains.

The arcading round the eastern arm was so thoroughly skinned and recut in the 19th century that the survival of the ghosts of a sequence of painted shields, perhaps hanging by fictive straps from fictive hooks, argues great tenacity. If these shields were part of the original scheme, finished by *c.* 1250, then they predated the cycle of shields along the nave aisles of Westminster Abbey.

Pre-Reformation painting: water-colour copy (*above*) of a lost censing angel, and (*right*) the fragment of a face found in 1986. *Photos Courtauld Institute Wall Paintings Department*

Restored heads and arms have led us to dismiss too soon the triforium carvings. The discovery of gold, and some passages of green over red on the draperies are leading to a re-evaluation of these lively figures. On the north side they represent kings and queens. One king bears a shield with the arms of England, and another a more sinister round shield with a frog or toad upon it. King David is of the company. On the south side are angels, one of them St Michael, another making music. The nave triforium continues the scheme, but with a sad drop in quality of both carving and paint.

It has long been known that the Chapter House carried an elaborate typological programme, of which the inscriptions were copied out *c.* 1200. This scheme probably occupied the vault severies. It would be hard to find anywhere else to accommodate it. The central column bears the tendrils of a Jesse Tree. The dado around the lower walls was painted with a continuous curtain, with angels carrying books just visible above them. Again, the scheme will have obscured striped walling.

An instance of the medieval respect for fine work of the past is provided by the refectory Christ-in-Majesty. Despite the brutal hacking back, it is still evident that this must have been an impressive piece of *c.* 1220-30. In the later 14th century pairs of niches were placed either side of it, and the original Majesty and flanking Evangelist symbols were newly back-grounded, and given gold haloes in the latest scalloped fashion. A second Christ-in-Majesty, this time flanked by infancy scenes over a heraldic dado, was painted in the 1330s in the Guester Hall. The whole building was torn down in 1862, and only an earlier 19th-century drawing testifies to the painted wall. The magnificent Tudor ceiling of the Prior's Lodging — compare the Bishop's Palace ceiling at Chichester — is another casualty.

One of the most startling changes has been to the effigy of King John, who now reposes in sober Purbeck. Charles Stothard, in his *Monumental Effigies* of 1817, reconstructed a dazzling array of coronation robes — crimson lined with green, neck and cuffs edged in gold and jewelled borders, over a tunic of yellow or cloth of gold, the whole completed by red hose and black shoes with gold spurs, his hair yellow, his face painted in flesh tints. In 1873-4 the effigy was gilded on the basis of a reference by Symonds of 1645. The gilding has been stripped off again in this century. So there have been many and drastic interventions, but the Courtauld team have been able to find enough traces of vermilion on the robes to vindicate (as usual) the accuracy of Charles Stothard.

In 1796 Valentine Green wrote: "The church at Worcester has had no example of ancient art that has survived the wreck of the Reformation." This report proves Mr Green to have been thoroughly wrong. Traces of colour, however slight, tell us a great deal about the original appearance of our greatest buildings, and, incidentally, provide a valuable means of discrimination between original surfaces and the work of Victorian recutters and splicers.

This survey will inform the decisions of the Dean and Chapter and their advisory committee for generations to come. It is to be hoped that the Friends of other cathedrals will commission similar studies.

CHURCH TIMES
17/4/98 P28

14.5 SPAB Manifesto

Reproduced from SPAB promotional literature, June 1993.

MANIFESTO OF THE SOCIETY FOR THE PROTECTION OF ANCIENT BUILDINGS

A Society coming before the public with such a name as that above written must needs explain how, and why, it proposes to protect those ancient buildings which, to most people doubtless, seem to have so many and such excellent protectors. This, then, is the explanation we offer.

No doubt within the last fifty years a new interest, almost like another sense, has arisen in these ancient monuments of art; and they have become the subject of one of the most interesting of studies, and of an enthusiasm, religious, historical, artistic, which is one of the undoubted gains of our time; yet we think that if the present treatment of them be continued, our descendants will find them useless for study and chilling to enthusiasm. We think that those last fifty years of knowledge and attention have done more for their destruction than all the foregoing centuries of revolution, violence, and contempt.

For Architecture, long decaying, died out, as a popular art at least, just as the knowledge of medieval art was born. So that the civilized world of the nineteenth century has no style of its own amidst its wide knowledge of the styles of other centuries. From this lack and this gain arose in men's minds the strange idea of the Restoration of ancient buildings; and a strange and most fatal idea, which by its very name implies that it is possible to strip from a building this, that, and the other part of its history - of its life that is - and then to stay the hand at some arbitrary point, and leave it still historical, living, and even as it once was.

In early times this kind of forgery was impossible, because knowledge failed the builders, or perhaps instinct held them back. If repairs were needed, if ambition or piety pricked on to change, that change was of necessity wrought in the unmistakable fashion of the time; a church of the eleventh century might be added to or altered in the twelfth, thirteenth, fourteenth, fifteenth, sixteenth, or even the seventeenth or eighteenth centuries; but every change, whatever history it destroyed, left history in the gap, and was alive with the spirit of the deeds done midst its fashioning. The result of all this was often a building in which the many changes, though harsh and visible enough, were, by their very contrast, interesting and instructive and could by no possibility mislead. But those who make the changes wrought in our day under the name of Restoration, while professing to bring back a building to the best time of its history, have no guide but each his own individual whim to point out to them what is admirable and what contemptible; while the very nature of their tasks compels them to destroy something and to supply the gap by imagining what the earlier builders should or might have done. Moreover, in the course of this double process of destruction and addition the whole surface of the building is necessarily tampered with; so that the appearance of antiquity is taken away from such old parts of the fabric as are left, and there is no laying to rest in the spectator the suspicion of what may have been lost; and in short, a feeble and lifeless forgery is the final result of all the wasted labour.

It is sad to say, that in this manner most of the bigger Minsters, and a vast number of more humble buildings, both in England and on the Continent, have been dealt with by men of talent often, and worthy of better employment, but deaf to the claims of poetry and history in the highest sense of the words.

For what is left we plead before our architects themselves, before the official guardians of buildings, and before the public generally, and we pray them to remember how much is gone of the religion, thought and manners of time past, never by almost universal consent, to be Restored; and to consider whether it be possible to Restore those buildings, the living spirit of which, it cannot be too often repeated, was an inseparable part of that religion and thought, and those past manners. For our part we assure them fearlessly, that of all the Restorations yet undertaken the worst have meant the reckless stripping a building of some of its most interesting material features; while the best have their exact analogy in the Restoration of an old picture, where the partly-perished work of the ancient craftsmaster has been made neat and smooth by the tricky hand of some unoriginal and thoughtless hack of today. If, for the rest, it be asked us to specify what kind of amount of art, style, or other interest in a building, makes it worth protecting, we answer, anything which can be looked on as artistic, picturesque, historical, antique, or substantial: any work, in short, over which educated, artistic people would think it worth while to argue at all.

It is for all these buildings, therefore, of all times and styles, that we plead, and call upon those who have to deal with them to put Protection in the place of Restoration, to stave off decay by daily care, to prop a perilous wall or mend a leaky roof by such means as are obviously meant for support or covering, and show no pretence of other art, and otherwise to resist all tampering with either the fabric or ornament of the building as it stands; if it has become inconvenient for its present use, to raise another building rather than alter or enlarge the old one; in fine to treat our ancient buildings as monuments of a bygone art, created by bygone manners, that modern art cannot meddle with without destroying.

Thus, and thus only, shall we escape the reproach of our learning being turned into a snare to us: thus, and thus only can we protect our ancient buildings, and hand them down instructive and venerable to those that come after us.

14.6 Factors affecting the decay of plaster

14.6.1 Introduction

This section deals with the social, philosophical and and physical reasons that affect plaster decay. It underpins the the analysis of the survey results in chapter 8.

This discussion is intended as a general overview to support the discussion of the survey results in chapters 7 and the analysis plaster survival in chapter 8.

14.6.2 Plaster loss and survival : politics, religion, fashion and philosophy

14.6.2.1. Introduction

This section introduces the the underlying non-physical reasons for plaster survival and loss.

14.6.2.2. How much plaster existed in medieval churches?

Since earliest times the architects and users of religious buildings have decorated their church walls, both to the glory of their deity and as means of practical instruction to priests and laity. Where material availability permitted, this was done directly onto (or into) the structure of the building. Sculpture was often the choice of the wealthy. Paint and plaster have always been much cheaper option. But it should not be forgotten that much solid sculpture was also painted. Wells and Exeter cathedrals, for example, were not only decorated with three dimensional sculpture, that sculpture was completely painted. *(Sampson, J., 1985, pers.com., Sampson, J., 1998, passim.)*

In more humble buildings, the carved freestones *(See glossary)* used on temples and cathedrals were not affordable. Where local and cheap materials had to be used for a buildings structure it was often impossible to decorate them directly. Soft, clay based daubs or rough rubble stone surfaces had to be prepared by applying layers of plaster. Such enforced plastering was not limited to religious buildings. From the Roman Palace at

Fishbourne, to late medieval farmhouses of the West of England, there appears to be a tradition of mural decoration using plaster and paint. *(English Heritage, 2003, pp. 1-46.)* Many, if not most, medieval churches were, from their earliest construction, decorated with extensive mural paintings. *(Park, D., 1999, passim.)* This was a pan-European phenomenon, and appears to have been remarkably technically consistent . For example, wall painting was almost always applied to plaster surfaces rather than directly to masonry. *(See chapter 5.)*

By no means all church mural painting was figurative. Large areas were commonly decorated in blocking out. This technique involved the painting of simulated stone joints onto the surface of the plaster. The origin of the practice is unknown, and we can only speculate about the fashion imperatives of its creators.

Examples of painting styles included in chapter 15 *(See photographic evidence, chapter 15, on CD.)* serve to illustrate the range and development of artistic styles. However, mural painting is a very complex field of study in its own right. Neither the materials used, nor the iconography are within the scope of this project.

Whilst the artistic details may be complex, the general picture is much more straightforward. By the end of the fifteenth century, English churches were, in the main, riotously full of carved and painted decoration. The wool trade and relative political stability had made England one of the richest nations in Europe, and this wealth was fully reflected in the architecture and decoration of churches. *(Matthew, D., 1983, passim., Swaan. W., 1977, passim., Evans, J., 1985, passim.)*

In much of Europe this wealth of church mural decoration either remains as created or has been restored. In England this is not so. Very little carved or painted medieval art remains visible in our churches. No reliable quantitative measure of the scale of survival is available, and this project is an attempt to partly rectify this lack of data.

To understand why so little apparently survives, it is necessary to grasp not only the effects of the English Reformation and Civil War, but also the religious attitudes of industrialised Victorian England.

During the fifteenth century the north west of Europe – England, Wales, Holland, Scandinavia and parts of France and Germany – underwent a series of religious upheavals collectively known as The Reformation. The amalgamation of so diverse a series of events under a single noun is a gross over simplification. It is only at a local level and in a specific context that the term Reformation has any real meaning. *(Green, V.H.H., 1964, passim.)*

In England, Henry VIII's Reformation was sparked by personal dynastic issues and European power politics involving the Papacy, rather than by any desire for theological reform. *(Scarisbrick, J.J., 1971, passim.)*

Henry's major physical impact on church art stemmed from the dissolution of the monasteries. (Parish churches did not suffer severe damage until the subsequent reigns of Edward, Mary and Elizabeth.) Though physical evidence is slight, substantial historical research suggests that monastic churches had a richness of decoration appropriate to their size and status. In other words, their mural paintings are likely to have been of a scale and quality far exceeding those in parish churches. *(See the reconstruction of the interior of Glastonbury Abbey Lady Chapel, in chapter 2, and in the photographic evidence, chapter 15, on CD.)*

In parish churches, the changes initiated by Henry were reinforced, first by Edward and Elizabeth, and then by Oliver Cromwell. Protestant attitudes were hostile to medieval painted decoration. They saw it as idolatrous and caused it to be covered by plain limewash. This painting over process not only concealed, it also protected . Paint and plaster was not generally destroyed by the Reformation or by Cromwell, it was usually merely hidden, for example at Puddletown, Winterbourne Steepleton or Upwey. (Caution is needed here, because as noted elsewhere in this project, *(chapter 3.6)* there never has been a wholly convincing national survey of the extent of hidden wall painting survival before the Victorian period.)

Despite surviving the religious upheavals from Henry's Reformation to the middle of the eighteenth century, the majority of painted plaster surfaces certainly failed to survive the Victorians.

14.6.3 Reasons for nineteenth century and later destruction

14.6.3.1 Introduction

This section attempts to analyse the survey data to see if fits any or all of the commonly held theories used to explain plaster loss. This is no easy task. Although the results of Victorian restoration activity are only too obvious, the reasons behind this destruction are complex, interlocking and not easily summarised. In other words, the survey never provided any easy proof of why lost plaster had been lost.

14.6.3.2 Antiquarianism, Ecclesiology and the Oxford Movement,

From the seventeenth century onwards there was increasing academic interest in all areas of historical research spurred on by an explosive growth in antiquarianism. Such academic study generated a new fascination within the Church of England for the study of earlier religious practices. Many (though by no means all) clerics began to look for an answer to the spiritual problems of their age by using historical study to re-create a lost ideal of medieval piety : Ecclesiology was born. *(Clifton-Taylor, A.,1986, chapter 1., Ecclesiological Society, 1847, passim.)* Ecclesiologists were both aided and inspired by eminent architects such Wyatt, Scott, Ferrey and Pugin, to the point where pure medieval architecture was seen as an essential part of the return to pure medieval religion. From the safe vantage point of the twenty first century it is difficult not to dismiss this search for piety via architectural restoration as somewhat romantic. However, throughout the nineteenth century it was a vibrant force driving the restoration of most of our parish churches. By removing the architectural changes of the previous four centuries, many nineteenth century clerics and architects genuinely thought they were clearing away accretions of godless and corrupt material that were preventing proper worship. There can be little doubt that much Dorset plaster loss is directly attributable to deliberate removal for Ecclesiological reasons. *(See photographic evidence, chapter 15, on CD.)*

14.6.3.3 Restoration : Scrape

Scrape was the term invented by the SPAB *(See glossary)* to describe the removal of internal or external surfaces in order to make a building appear neater. Lichfield, Tewkesbury and Salisbury Cathedrals are all famous examples of buildings whose interiors have been scraped. Rather than repairing damaged plaster, or living with the damage, all of it was removed. Whether this approach was motivated by ignorance of, or malice towards, ancient plaster is impossible to tell. Possibly it happened because scraping was a cheaper option than repair. Many of the Dorset churches in the survey were found to have been aggressively and thoroughly scraped. *(See photographic evidence, chapter 15, on CD.)*

Scraping of whole wall surfaces was usually done using a steel drag *(See glossary)*, whilst scraping of architectural details such as carved capitals was usually done with a hammer and chisel.

Scraping the historic plaster from walls often created substantial visual issues. The masonry under the plaster was usually found to be both irregular and uninteresting. This is hardly surprising since an obvious reason why medieval masons used render in the first place, was to hide the unappealing masonry beneath. Once such masonry was exposed, a common reaction was to beautify it by elaborate patterns of decorative pointing. So called double struck or ribbon pointing was a commonly used device by restorers unhappy with what their scraping had revealed. Again, many examples of this were observed during the survey, and it is hard to produce any analysis of the survey evidence that does not imply that simple ignorance has been a major factor in Dorset plaster loss. The scrapers did not realise what their activity would reveal. *(See photographic evidence, chapter 15, on CD.)*

14.6.3.4 Restoration : Overskim

The sample of possible and definite plaster survival was further analysed to record the churches where surviving plaster is possibly or definitely overskimmed by later plaster. The criteria for inclusion were :

i Where possibly Pre-Reformation plaster is visible at the edges of later plaster. The logic here being that best practice has always required the removal of all potentially loose substrate before application on new plaster. If the Victorian plasterers ignored best practice at the edges of their work, it is very possible that they ignored it throughout.

ii Where the apparent thickness of the latest plaster would suggest that it has been designed to cover substantial substrate irregularities. The logic here being that since it is never best plastering practice to build thick layers, best practice may also have been ignored in preparation of the substrate and earlier plaster not removed.

It should be noted that definite overskim cannot be taken as a quantitative measure. Overskim is recorded as such if *any* early plaster was visible at its edges. This does not mean that the early plaster extends beyond the exposed areas, simply that it is a possibility.

14.6.3.5 Restoration : reordering

Just as overskim plaster can protect early plaster, so also can any object applied over it on the surface of the wall. One of the most commonly found attachments to church walls are monuments and memorial tablets.

Most of the monuments found during the survey were modest in size and rarely older than the seventeenth century, but even these can protect significant areas of plaster. Similar protection to ancient surfaces is provided by panelling, wainscoting and even fitted furniture such as cupboards. Good examples of such protection were observed at Cerne Abbas, Long Bredy, Warmwell and Winterbourne Steepleton. *(See photographic evidence, chapter 15, on CD.)*

However, there is a serious problem when trying to analyse the effectiveness of the plaster protection offered by monuments or other fittings. Victorian restorers appear to have been very reluctant to dispose of monuments in the way they were happy to discard plaster, but his does not imply that they left them unmolested. It was extremely common for Victorian restorers to reorder the internal fittings of a church, for example at Swanage or Winterbourne Martin. Pre-Victorian fixtures were taken down and moved to more suitable locations. This might be to provided more usable interior space of to give a more organised visual presentation to the building... simply to make the interior neater. Winterbourne Martin is an excellent example of this process. *(See photographic evidence, chapter 15, on CD.)*

It is thus unsound to analyse the survey data and make a strong link between the presence of monuments or other fittings and the likelihood of plaster survival.

14.6.3.6 Archaeology : knowledge versus art

The antiquarianism of the seventeenth and eighteenth centuries has lead directly to the growth of modern academic archaeology. It is undeniable that large amounts of information have been yielded by the archaeological survey of churches. *(Wood, J.,1994, passim.)* Some of this study has certainly helped to generate interest in ancient church fabric and may have increased the public willingness to see resources committed to its repair. The work of Taylor and Taylor, for example, has generated greatly increased interest in Saxon church architecture. *(Taylor, H.M., 1978-80, passim.)*

From a plaster point of view this new knowledge has been won at great cost. There is a fundamental contradiction between :

i the aim of acquiring detailed knowledge of a structure by physically un-picking it using archaeological techniques

and

ii the aim of preserving historic surfaces because they have *intrinsic* artistic merit and historic value.

Over the last century and a half, powerful players, including the Council for British Archaeology and SPAB, have argued over this issue of knowledge gained versus fabric lost. Neither camp has won complete victory, but the balance since 1945 has swung in favour of archaeologists. There have been numerous examples of the destruction of wall plaster in the cause of archaeology, such as at Deerhurst, Barton on Humber and Repton. *(Harbison, R,., 1992, Barton on Humber.)* *(See photographic evidence, chapter 15, on CD.)*

As sourly noted by Harbison *(Harbison, R., 1992, Barton on Humber)* the archaeologically inspired damage at Barton-on-Humber is the responsibility of English Heritage. This is not accidental. English Heritage is the successor organisation to the Ministry of Works. From the early years of the twentieth century, the MoW conserved most of Britain's famous ruined abbeys and castles. This work was informed by an archaeological rather than an architectural point of view, and has lead to large scale loss of plaster so that ruins could be interpreted and structure consolidated. *(Thompson, M.W., 1981, chapters 1, 2 and 3., Induni, B., 2005, pp.1-20).*

The issues outlined above are national, if not international. Analysis of the survey data produced no direct evidence of any archaeologically inspired plaster loss in any Dorset church. There could hardly be a better example of the difficulties inherent in finding valid criteria against which to test the survey data. Mechanisms of plaster loss that are commonplace nationally do not necessarily apply to Dorset churches. As noted elsewhere in this thesis, it would be unwise to generalise the findings of this survey to other parts of Britain without exercising considerable caution.

14.6.3.7 Architects' status

The late eighteenth century saw a substantial increase in the role and status of the church architect. At a national level, dramatic improvements in literacy, communication, and travel allowed the practical implementation of the new philosophy of restoration to be publicised and applied. With the advent of rail travel in the nineteenth century, it became possible to hire a nationally famous architect to direct work at local level. For example, William Weir, one of the major early architects of the Society for the Protection of Ancient Buildings, and famous for describing himself as a drains man, *(Venning P.,1986, pers.com.)* used to travel by a combination of railway and penny-farthing bicycle ! Additionally, architects with national practices became nationally famous celebrities and acquired the authority and status needed to sell new and fashionable ideas to local parishes.

This is an area that merits further research, but this project has not attempt to gather the relevant data in sufficient detail.

14.6.3.8 Deferred maintenance

This is the wonderful modern surveyors jargon for neglect.

As a direct result of the Henrician Reformation the church lost both wealth and authority. These were further damaged by Cromwell's Commonwealth. The apparently unquestioning faith of the medieval world was challenged and with this loss of certainty went much of the lay persons' willingness to fund the church. An immediate practical result was a sharp decline in the quantity and quality of church repair. This directly destroyed much decorative plaster. Lack of maintenance and repair made churches much damper places, and dampness is one of the main reasons for plaster failure and loss *(See below, sections 14.6.4 and 14.6.5.6)*. Lack of maintenance also meant that many churches became seriously dowdy, so that when resources became available in the nineteenth century, they were natural targets for radical decorative improvement. Unfortunately this redecoration frequently involved stripping all the old wall plaster.

The survey produced considerable evidence that historic plaster has been stripped and replaced as a direct response to dampness. However, it is not easy to relate this evidence to Post-Reformation neglect. For example, changes in soil levels outside the church and the introduction of heating systems will also have influenced the levels of dampness. Thus the extent to which deferred maintenance has directly caused plaster loss remains a matter of speculation.

14.6.3.9 Technical change

Plastering techniques, tools and materials remained almost unchanged from the ancient world until the late eighteenth century. *(Salzman, L.F., p.330-349.)* At this time technical developments in the production of rapid setting plasters caused changes in working methods. *(Ashurst, J., 1984, p.VIII., Sickells, L.B., 1987, passim.)* Plasters that set rapidly have the advantage of allowing work to be completed quickly, but they do not allow time for multiple reworking of the surface. In other words, rapid setting plasters have to be accurately applied at the first attempt. To cope with this, plasterers started to use long straight floats to lay on the plaster. Long straight floats produce flat surfaces, quite unlike the gentle waviness of medieval plaster surfaces. This technically driven change was amplified by the reducing cost of steel tools and a developing fashion for classically inspired crispness and flatness in surfaces.

Conversely, once the combination of rapid setting plasters and modern steel were introduced it became very difficult to reproduce the wavy surface of medieval plaster, and there was every reason to replace it with new and fashionably flat surfaces.

The survey produced abundant evidence that nineteenth century and later plaster surfaces reflect the materials and working techniques that produced them, but there were no examples where it was certain that old plaster had been replaced or overskimmed solely because of new plastering technology. The evidence of the survey suggests that technical change has been one factor that caused the loss or overskimming of historic plaster but that it is only one among others.

14.6.3.10 Wealth and guilt

The Industrial Revolution brought wealth to England on a previously unknown scale, but this wealth was bought with many sorrows. The social problems generated by population growth and unequal wealth distribution could only be avoided by the very richest in society. Many truly remarkable reformers emerged such as Lord Shaftesbury or Edwin Chadwick. Many other less famous figures toiled to abate the evils of Victorian society. The Church of England at first refused to admit that society was changing, and made little provision for the huge populations of the new industrial towns. but by the 1880's had embarked on a massive programme of church building and restoration, so that the lost souls of the industrial working class could be saved. This programme was both caused by, and funded by, the growth of industrialisation. The new factories created the wealth that paid for church restoration and created an entrepreneurial class with the need to assuage its guilt in piety. Of course it is true that Dorset (outside of Weymouth/Portland and Poole) never saw industrialisation on the scale that affected the Midlands and the North, *(Victoria County History, 1968., passim.)* but Victorian wealth and the moral problems behind it were national issues that affected the whole of England in varying degree. *(Hobsbawm, E.J., 1969. passim.)*

As well as responding to changes in society, the Church of England underwent a period of massive reform during the Victorian period. At the start of the nineteenth century it was beset by internal problems. Among many others were :

i Pluralism, where priests derived the tithe *(See glossary)* income from more than one parish but rarely visited any of them, was widespread.

ii Pew rights. Many of the parish poor were effectively excluded from church because pew rights had been bought by richer families. These private pews occupied all the available space in the church. Puddletown still retains the physical evidence of this.

It is highly likely that the reform of these two issues directly influenced the pace and extent of Dorset church restoration. New clergy, who actually lived in their parish and took a direct interest in the access to worship of the local poor, provided both the stimulant and the mechanism by which national wealth could be directed towards Dorset churches.

That the combination of Victorian wealth and guilt was a major driver in the restoration of Dorset churches cannot be seriously doubted. However, the evidence for this view comes from the social and economic history of the Victorian period and cannot be found written directly in fabric of Dorset's churches. The survey did not produce and direct physical evidence linking guilt and wealth to plaster loss.

14.6.3.11 Ownership and responsibility

A striking feature of the pre-nineteenth century organisation of the English Church was the division of responsibility for the upkeep of the parish church. Leaving aside exceptions such as royal peculiars *(See glossary)* or private chantry chapels *(See glossary)*, the priest was responsible for the chancel, and the people of the parish for the rest of the building. *(Bettey, J.H.,1987, passim.)*

This division of responsibility has produced some bizarre architectural mismatches (e.g. Warmwell), *(See photographic evidence, chapter 15, on CD.)* but this survey suggests that the greatest impact in Dorset has been to cause more extensive and more thorough restoration of chancels than of other parts of churches. Warmwell is an excellent example. *(See photographic evidence, chapter 15, on CD.)* Victorian vicars and rectors seem to have been better funded and more energetic strippers and overskimmers than their parishioners, but the evidence needs careful interpretation.

Loders, for example, has a church whose rich architectural detailing suggests both a rich priest and a rich parish. *(See photographic evidence, chapter 15, on CD.)* Such a wealthy parish should have been able to afford any level of restoration that it might desire, and yet did not choose to strip its medieval plaster. Clearly any link between ownership, resource and plaster survival is not automatic. For example, the survey suggests that Abbotsbury's present condition is a result of complex changes of wealth and ownership. Local wealth made possible the creation of the beautiful hand moulded ceiling in the chancel, *(See photographic evidence, chapter 15, on CD.)* but that same wealth did not lead to the destruction of medieval plaster elsewhere in the church. Restoration is expensive and so must depend on wealth and ownership, but it does not necessarily work the other way round : wealth does not always lead to restoration.

To summarise, the survey has not produced any convincing evidence of a link between the poverty of a parish and the likelihood of plaster survival. More than this, it is not possible to judge the richness of a medieval parish by its surviving church. Any firm identification of wealth would have to involve extensive documentary research. Even if the physical survey were supplemented by documentary evidence, there is a further major source of uncertainty. Much remodeling, repair and restoration appears to have been made possible by random bequests that do not reflect the wealth of the parish as a whole.

14.6.3.12 Loss by conservation

Archaeologists have not been the only people to cause loss of wall surfaces in the search for knowledge. For wall painting conservators, the traditional method of revealing successive layers of painted plaster was simply by removing each one.

Such practice was standard and is probably still commonplace. No central records are kept of the quantity and nature of investigations that are undertaken. The Council for the Care of Churches *(See glossary)* does keep a library of conservation reports, but personal experience, gained during conservation contracting, suggests that these are far from a complete reflection of reality.

The career of Eve Baker for example, *(See biographical notes section at end of bibliography)* extended over several decades, and must have involved many hundreds of churches, but she apparently kept no significant records of the extent of her work. There is no reason to assume that she was exceptional in this respect. As ever in conservation, the commercial way in which contracting is organised, with most work let by competitive tender, militates against the keeping of public records.

Conservation of wall paintings does not often involve the permanent removal of whole layers of plaster. A much more common source of conservation induced damage has been the cutting of small windows *(See glossary)* to check for earlier paint layers. It is tempting to assume that benefits of knowledge gain by window cutting outweighs the limited damage that is done. However, there is a real risk. Wall painting exploration work at Fiddleford Manor (in the guardianship of English Heritage) highlights the potential danger. Exploratory windows have given parts of the interior a distinctly moth-eaten appearance. *(See photographic evidence, chapter 15, on CD.)* This could easily be remedied by the application of a fresh coat of limewash.... However, English Heritage, and the Ministry of Works before them do not have a happy record of dealing with distressed surfaces. In common with many architects and owners, the Ministry of Works reaction to damaged surfaces has often been to strip them completely. Many of the castles and abbeys throughout Britain bear witness to this ruthless removal of unsightly damaged material. (for example, Portland Castle or Chepstow Castle) It may true that attitudes have improved in recent times, but there seems to have been little or no recognition that mistakes were made in the past. Thompson's celebration of the work of the Ministry of Works up to the nineteen seventies has yet to attract significant informed criticism. *(Thompson, MW., 1981, Chapters 1,2 and 3.)*

Another conservation induced mechanism for plaster loss is the use of inappropriate conservation treatments. Perhaps most significantly, throughout much of the twentieth century, Professor Tristram deployed a system for consolidating plaster and wall paintings using wax. This has subsequently been found to be very damaging, and much effort has been put into its reversal. It is uncertain how many currently popular conservation treatments will cause similar problems in future. *(See also chapter 3.6.3.11.)*

How the comments in this section can be directly applied to Dorset churches is hard to say. Aside from the ruined church at Knowlton, it is unlikely that Ministry of Works attitudes have had a direct influence on church conservation. However, it is likely that the work at Portland Castle, Corfe Castle and Fiddleford Manor have all played a part in shaping the attitudes of the Council for the Care of Churches, Archdeacons, Diocesan Advisory Committees and church architects. It will have legitimised plaster stripping, without having directly enforced it.

14.6.4 Physical and environmental reasons for plaster loss

14.6.4.1 Introduction

In addition to the general reasons that have been discussed above, there are a range of physical factors that contribute to the loss of church plaster. These are examined in detail in this section.

All of the issues raised in this section are complex, and none has attracted exhaustive research. This project can only deal with them as contributory factors to the loss of historic plaster. The notes below are thus not intended to fully explore each issue.

14.6.4.2 Dampness : General effects

By far the greatest enemy of plaster survival is dampness, and this survey has shown that many of Dorset's churches were constructed in naturally damp locations. This is discussed in detail below..

Generally, dampness destroys plaster by a combination of the following five issues :

i Directly dissolving the materials used in plaster,

ii Promoting biological growth that causes both chemical and physical disruption of the plaster,

iii Altering the crystal structure of the plaster and thus causing swelling and distortion,

iv Providing the mechanism for introducing soluble mineral salts that crystallise inside the pore structure of the plaster and cause physical disruption and,

v Providing the conditions where frost can become disruptive to the plaster.

It should be remembered that whilst these decay mechanisms are listed separately here, in reality they tend to be found as complex cocktails where individual effects inter-react with one another.

14.6.4.3 Rain penetration

Traditional building materials used for walling are not usually waterproof. All of the Dorset building stones, except flint (churt) are both porous and permeable. *(Thomas J., 2003, pers.com.)* Mortars were, and still are, porous and permeable unless expensive additives are used to modify them *(Neville, A.M., 1983, pp.83, 101.)* Design details, such as raised parapets, valley gutters, gable copings and string/drip courses are inherently leaky because they are made from porous and permeable materials. It is not, nor has it ever been, possible to construct the masonry of a wall or coping so that the joints remain water-tight. *(Schofield, J., 1984-2003, pers.coms, Hadlington, M., 1985-2005, pers.coms.)* Cerne Abbas and Cranborne are excellent exemplars of the problems cited here. (Thermally induced movement is the main problem, but a full explanation is outside the scope of this thesis.) These basic material and construction problems are greatly compounded by the action of wind and rain. If rain fell predictably vertically, weatherproofing buildings would be relatively easy, but it does not. Driving rain is a well recognised phenomenon. It is a particular problem when large buildings are constructed in exposed locations, using poor quality materials, and less than perfect detailing... i.e. most Dorset churches! It seems likely that medieval builders were well aware of the problem of rain penetration. There is substantial evidence that most large buildings were either externally rendered or limewashed. Both treatments are very effective at reducing rain penetration. The current fashion for the exposure of stone is a Victorian invention. *(Schofield, J., 1984-2005, pers.coms., Hadlington, M., 1985-2005, pers.coms.)(See also Chapter 2).*

Rain ingress through walls that were designed to be rendered, but are now bare stone, is a serious issue even when the masonry is of high quality and the stones are accurately shaped and jointed. Such an ideal situation was not found in many of the surveyed churches. Langton Herring is far more representative of the churches in the survey. Here, small irregular stones produce very numerous and very wide joints. These joints always crack under thermal stress, and the cracks provide an excellent pathway for rain to enter the building. *(Schofield, J., 1984-2003, pers.coms, Hadlington, M., 1985-2005, pers.coms.) (See photographic evidence, chapter 15, on CD.)* Since the walling at Langton Herring is typical of many Dorset churches, it is likely that the loss of external renders has caused substantial rain ingress and lead to the loss of much internal plaster.

14.6.4.4 Rising dampness

Very few, if any, English soils are ever completely dry *(Encyclopaedia Britannica., 1950, volume 18, p.20.)* The interaction of wet English weather and porous and permeable subsoils means that there is a near universal and permanent reservoir of ground-water under buildings. Unless a building contains a waterproof barrier, this ground water is drawn into foundations and up into walls by the phenomenon of capillary action. This causes water to diffuse outwards and upwards through any porous and permeable assembly of building materials. As the water rises, it will be drawn towards any surface from which it can evaporate. This evaporation will commonly be concentrated on a zone from floor/ground level up to around 1.5 metres above this. The actual location and size of the evaporation zone can vary widely depending on the nature of the materials used in construction and decoration of the wall and on the salt content of the water. Soluble mineral salts are hygroscopic, and high concentrations can attract considerable volumes of water. *(See below : 14.6.4.19).*

This survey revealed evidence of significant damage to plaster due to rising dampness in the majority of medieval churches. Particularly striking examples were observed at Litton Cheyney, Long Bredy, and Loders. *(See photographic evidence, chapter 15, on CD.)*

14.6.4.5 Raised ground levels

Churches in Dorset, and elsewhere, suffer acutely from this problem. The main driver is the intensive long term use of the land adjacent to the church for burial of the parish dead. This greatly increases the volume of soil in the graveyard and contaminates the soil with significant quantities of soluble mineral salts *(See below : 14.6.4.19)*. Once exterior ground levels are raised above the interior floor level of the church, a direct path is created for the transport of soluble mineral salts into interior plaster and decoration. This is well illustrated by graveyard to the south of Puncknowle. *(See photographic evidence, chapter 15, on CD.)* Although a trench has been dug in relatively recent times to isolate the church from the raised ground, it is still obvious that the problem was severe.

Long Bredy *(See photographic evidence, chapter 15, on CD.)* illustrates a different aspect of the raised ground level problem. In common with many Dorset churches, (e.g. Hillfield or Tarrant Crawford) *(See photographic evidence, chapter 15, on CD.)* the church is built on a sloping site. Soil creep over many years has caused the exterior ground level on the uphill side of the church to rise appreciably above the interior floor level. This has caused substantial damp damage to low level internal plaster.

14.6.4.6 Choice of site conflicts

At a national level it is widely recognised that many major religious buildings are not constructed on suitable sites. The cathedrals of Wells, Winchester, Salisbury and York, for example, are all constructed on subsoils that are far from ideal. There have been ongoing crises over settlement and subsidence since construction began. As with most aspects of the early medieval church the reasons behind the choice of these cathedral sites are obscure. However, it does seem likely that many early Christian sites took over existing pagan shrines. Such shrines are said to have commonly been holy wells . In other words, the religious imperatives outweighed building logic for the choice of site. *(Kerr and Kerr, 1988, p.75)*

Patterns of settlement are, of course, very varied across the country, *(Brunskill, R.W., 1978, passim.)* but the conflict between inherent site dampness and church location has been a feature revealed by this survey. Upwey, Long Bredy, Litton Cheyney, Hillfield and Tarrant Crawford are all examples of where the choice of site has virtually guaranteed that the church will have a dampness problem. *(See photographic evidence, chapter 15, on CD.)*

An interesting and unanswered question is how far medieval masons used waterproof mortar to mitigate the effects of building in damp locations. *(Howell, J., 1999, passim.)*

14.6.4.7 Materials, structure and design

Just as the choice of site for a church depends on a complex process of compromise between conflicting objectives, so also does the choice of materials and the design of the structure. Choice of building stone was one of the first compromises to tax the design skills of the medieval Dorset church builder.

Locally available stones are very varied in quality *(Thomas, J., 1993 and 1994, passim.)*, but the only good Dorset stones are from Purbeck and Portland. These were sparingly used before the eighteenth century because they were difficult to work. Ham Hill and Beer stone are used in the north and the far west of the county, but these were expensive imports from neighbouring Somerset and Devon. Transport costs prohibited their widespread use for anything except key details such as battlements, copings and door and window details. (Very rich parishes such as Wimborne Minster are exceptions, and do use materials brought over long distances.) Cheap local stone, such as Greensand at Langton Herring, is hard to work with a chisel but splits readily with an axe into small irregular blocks. Small, irregular stones mean very extensive areas of jointing mortar... and extensive jointing makes for intensive water penetration. *(See above : 14.6.4.3)* Such water penetration will quickly damage internal plaster. It is highly improbable that the original builders ever intended such poor masonry to be exposed. The vast majority of medieval churches appear to have been rendered and or limewashed. *(Schofield, J., 1987 on, pers.coms., Bucknall, J., 1988 on, pers.coms.)*

Even where high quality, accurately shaped stone has been used, the architectural design of a church often guarantees that water ingress will be a problem. Large towers such as those at Litton Cheyney, Cranborne or Cerne Abbas are wonderful statements of wealth and pretension, but it is hard to conceive of a more effective way of producing a damp building. The problems caused by rain penetration can be severe at low level, but they are always worse on tall, exposed structures. Several of the non-specialists who occasionally accompanied the survey team asked, "What are church towers for?" As ever with apparently simple questions, there is no simple satisfactory answer. Without direct communication to the fifteenth century architect of the tower at Lytton Cheyney, any answer is only a guess. Whatever the original intentions, an unintended effect has been to introduce considerable dampness into the west end of the church, because :

i the tower is tall, exposed and thus traps driving rain,

ii the parapet and associated internal valley gutters trap rain,

iii flagpoles usually leak where they penetrate the roof covering,

iv battlemented copings introduce complex joints and an increased surface area which increases water ingress as wind vibration and thermal stress work the joints and,

v buttresses and projecting stair towers again increase surface area and thus total rain penetration.

Apart from towers, many other standard features of church masonry cause dampness problems. Drip courses, *(See glossary)*, for example, may shed some water locally but are probably of little overall utility, as the dripping water will be blown back onto the surface of the masonry a short distance below the the drip course. *(See below : 14.6.4.11)*

Much has been written on the art history of parish churches, but extensive documentary research has found almost nothing on why historic church architecture is not designed to perform even the most basic building functions very well. This is remarkable since this survey has revealed extensive evidence of poor building performance. (Evidence for this was not collected formally, but did generate much interest during the survey.) Quite why medieval church architects seems to have felt able to ignore the rules applied to other buildings is a matter that would reward further research.

Cerne Abbas presents a typical assemblage of church architecture. It has developed by a slow process of accretion of detail and modification of structure that is fascinating, but has done nothing to produce a weather resistant envelope. *(See photographic evidence, chapter 15, on CD.)* Visible water ingress problems here are due to small stones, uneven bed joints, generally over-wide joints and multiple complexity of detail. The coping stones on the porch and chancel gables are poorly detailed and bound to leak. The buttress kneeler stones also introduce dampness into the walls. The gravel in the foreground shows that a French drain has been inserted to try and reduce the problem of rising dampness caused by raised ground levels, lack of any damp proof course and poor rain water removal, particularly the use of battlemented eaves and valley gutters, compound all the other problems.

14.6.4.8 Difficult details : valley gutters

Langton Herring typifies many of the churches in the survey because it has been considerably extended since its original foundation. Across Dorset, at least three forces were at work promoting church extension :

i The English church became more prosperous, which permitted and encouraged a quest for more impressive buildings as statements of piety and community pride.

ii Increases in individual wealth created a demand for private altars and chantry chapels.

iii Larger populations demanded more space at the same time as creation of private chapels within the church was restricting it.

The medieval response to these demands was often haphazard and rarely based on the need to reduce maintenance. The most common response was to add aisles to the sides of the nave. This usually meant the creation of valley gutters at the junction of the nave and aisle roofs. Such gutters are a maintenance disaster. They always block. They always leak. The leaks go undetected for long periods and discharge water directly into the plaster of internal arcades. It is hard to conceive an architectural detail more likely to destroy internal plaster surfaces. This image repeats many of the issues already raised but raises a new problem. Even partial blockages from fallen leaves, dead pigeons or ice will divert water horizontally into the structure and internal plaster.

Valley gutters are also commonly found as an integral part of battlemented parapets. The design of battlemented parapets inevitably creates :

i A considerably increased area of stone that will absorb water.

ii Complicated jointing that will be worked by thermal stress and wind vibration so that it cracks and admits water.

iii Guttering systems that are prone to failure and discharge water into the structure of the wall when they fail. *(Bucknall, J. 1990, pers.com.)*

It must be stressed that there is no causal connection between battlemented parapets/valley gutters and plaster loss. Cerne Abbas has the all the details likely to encourage water ingress, but it also has surviving plaster. The essential link between difficult architectural detail and plaster loss is neglected maintenance. The project did not gather detailed evidence of links between roof design and maintenance and the survival of plaster. It is an area offering substantial scope for further research.

14.6.4.9 Difficult details : copings

The design of roofs is not accidental. In damp environments, thousands of years of empirical experiment have perfected the design of pitched roofs made from relatively small overlapped units. These can be metal, stone, clay or straw, but one principle is always constant : the units overlap extensively. Stone copings are miniature roofs, and should also be made of overlapping units, but they very rarely are. Almost all copings are, like those at Cranborne, *(See photographic evidence, chapter 15, on CD.)* simply butt-jointed end to end. Thermal stress rapidly (often within weeks) cracks the mortar in these butt-joints and allows water to enter. This water percolates down through the core of the wall and evaporates to both the inside and the outside. Where it takes a path to the inside of the building it is likely to do considerable damage to internal plaster. Before the Victorian period, external evaporation was probably much greater than internal evaporation since the external effects of solar heating and wind would tend to draw moisture outwards from the building. Since early Victorian times, the equilibrium state of damp church walls has changed in at two ways:

i Churches installed heating systems. This lowered the relative humidity inside the church and forced a greater proportion of water entering the wall to evaporate into the interior, thus passing through and damaging interior plaster. It is, for example, probable that this effect has been the main cause of the decay to painted plaster on the chancel arch at Puncknowle. *(See photographic evidence, chapter 15, on CD.)*

ii Less porous and permeable mortars (patent cements (*See glossary)* and Ordinary Portland Cement) have been used for external pointing and rendering. *(Sickles, L.-B., 1987, passim.)* This change has forced water entering a wall to take the easiest path, and evaporate into the inside of the building. The painted plaster at Tarrant Crawford appears to be currently deteriorating for this reason *(Source : personal informal and irregular observation by this author of debris accumulated on the nave floor over a period 1990-2005.)*

14.6.4.10 Difficult details : buttresses

The coping and kneeler stones that cover each widening of a buttress are usually formed in stone which is porous and permeable. *(See photographic evidence, chapter 15, on CD.)* Since these stones are effectively roofs for the rest of the buttress structure, the porosity and permeability of the stone will allow water to percolate into the core of the wall. This survey has not revealed an example of direct connection between a buttress detail and loss of internal plaster, rather it is the general increase in internal dampness that is the issue.

14.6.4.11 Difficult details : string/drip courses

The string and drip courses found on many of the towers visited by the survey illustrate the danger of assuming, intuitively, that an architectural detail works as intended. It is an open question as to whether strings and drips shed more water than they absorb. There is no doubt that the medieval creators of the tower went to great trouble and expense to create the string/drip courses at Cranborne, Cerne Abbas, Lytton Cheyney and elsewhere. However, there is room for considerable doubt as to why they did it. Some commentators *(Clifton-Taylor, A. and Ireson, A.S, 1983, passim, and Schofield J., 1987, pers.coms.)* suggest that the intention was entirely to throw water clear of building. This does not seem likely as even the slightest wind would bring the drips back to the surface of the tower a short distance below the string/drip course, for example at the north side of the tower at Winterbourne Steepleton.

Others have suggested that they were stop beads designed to hide day-work joints in the render that would have covered the tower *(Young, R., c.1991, pers.com).* This project has been able to find no published data to settle the issue. The visual evidence at Cranborne suggests that string/drip courses catch and retain water rather than effectively shedding it. Whatever the design intention, observation of the current condition of these string/drip courses shows that they have a much richer flora than that on surrounding areas of similar stone. This implies that the porous and permeable nature of the stone, combined with its forward extension, is making the string/drip stones wetter for longer than the walling stone above and below them. The increased moisture content of the stone is promoting and sustaining the growth of the richer flora, as for example on the tower at Cranborne.

This survey has not looked for, or produced, any direct evidence that any of the architectural/structural details discussed above has directly contributed to the loss or survival of particular painted plaster. Indeed, the use of Cranborne to illustrate many of the issues is paradoxical, since Cranborne contains a remarkably extensive plaster survival. But looking for direct connections between the presence of a particular detail and the loss of plaster is to miss the point. The evidence of this survey, together with the general literature of building conservation, and the author's personal experience suggests that there *is* a general connection between architectural/structural detail, water ingress and plaster survival. Further research may well be able to demonstrate this link.

14.6.4.12 Difficult details : Windows

Since the end of the Norman period, church windows have been traditionally made from small glass panes (quarries), held in lead cames, *(See glossary)* and set directly into stone frames. This glazing system represented the most economical use of crown glass, *(See glossary)* which was the main source of window glass until late in the nineteenth century, when Pilkington perfected the industrialisation of glass manufacture.*(Channer, G., 1987-97, and Clare S., 1996 on, pers. coms.)*

Economical it may be, but perfect it is not. Large mosaics of small pieces of glass, held in lead, bend and vibrate under wind pressure. *(Clare S., 1996 on, pers. coms.)* Over time this breaks the mastic seal between the glass and the lead, and the window starts to leak. Leakage also often develops where the window is fixed with mastic or mortar into a glazing groove in the stone frame. The design of most church window cills does nothing to keep this leakage out of the building. (Numerous attempts have been made, since Victorian times, to design a cill detail that will catch leakage and condensation and direct it outside the building, but whilst this survey has observed many installed, none appeared to be functioning correctly. Designs either involve inserting a lead tray between the bottom of the glass and the cill or creating a drainage groove on the inside top of the cill connected to a drain hole bored through to the outside of the cill. Both systems block with debris and fail to stop water penetrating to the inside of the church.) *(Schofield, J., 1987 on, pers.coms. and personal observation.)*

The survey revealed frequent (the exact data was note recorded) evidence of where windows had been leaking. As with other topics in this section it is not possible to single out a case where window leaks have directly lead to plaster loss, but there can be no doubt that window leakage has generally been a major contributory factor in the loss process.

14.6.4.13 Difficult details : Rain water goods and drains

The Victorian development of cheap cast iron revolutionised techniques for removing rain water from roofs. For the first time in history, reliable, durable and cheap guttering and downpipes became available. There is little doubt that newly installed guttering and drainage made Victorian church interiors drier than they had ever been before. But the advantage of cast iron gutters only lasts whilst they are properly maintained, and whilst there is somewhere for the collected water to go When gutters, downpipes and drains fail, they concentrate large volumes of water into small areas of a building. This can do considerable damage. Though not a formal part of this survey, a limited record of the condition of rain water goods was kept. This suggests that around half of Dorset churches have serious rain water goods defects. This poses a serious threat to the continued survival of historic plaster.

Cranborne typifies the faults found in many of the surveyed churches *(See photographic evidence, chapter 15, on CD.)* :

i Inadequately sized downpipes. A downpipe may well be capable of carrying all the rain water that is likely to fall on an area of roof, but rain is not all that downpipes have to carry. Leaves and dead pigeons will block narrow pipes. Blocked downpipes can discharge large volumes of water into the masonry behind them.

ii Bends in downpipes to accommodate architectural details such as plinths. Even if the inadequate diameter of a downpipe does not cause blockages, the introduction of tight bends is almost bound to. Maintenance of RWG is difficult, expensive and unglamorous. It is often neglected, and such neglect is guaranteed to introduce large volumes of water into a building.

iii Inadequate eaves and verge overhang to roofs. The cropping of eaves overhangs by Victorian restoring architects was made possible by the development of cast iron guttering. Roofs could be made cheaper by reducing the quantity of slate and timber, but only by enforced reliance on gutters and downpipes to remove rainwater. Whilst these rain water goods functioned correctly, churches were drier than they had ever been. However, a cumulative backlog of maintenance has meant that many gutter and downpipe systems are in a serious state of disrepair. *(Evidence noted as an incidental part of this survey, but not formally recorded.)* In other words, the Victorian substitution of gutters for eaves overhang gave a short term benefit, but is now a major threat to internal plaster.

iii Corbel table guttering. *(See photographic evidence for Cranborne, chapter 15, on CD.)* Again a Victorian church architectural fashion, this detail places a continuous projecting stone corbel table at the head of a wall and lays a cast iron gutter directly on to it. This means that the lowest course of roof tiles does not oversail the wall top. So long as the gutter functions correctly the detail works. As soon as the gutter starts to leak, water is concentrated directly in to the wall head. Gutters always leak. The joints always fail under thermal stress. On cast iron gutters, areas that cannot easily be painted always corrode. When a cast iron gutter is set on a corbel t able it is impractical to paint its inward facing lower areas, and leaks are inevitable.

Thus, once again, a Victorian change to traditional detail has not caused instant damage, but is now a major threat to internal plaster.

14.6.4.14 Condensation

Condensation is a much misunderstood and under-researched source of dampness in churches . A full discussion is outside the scope of this project, but the principle problem is the interaction of intermittent use and intermittent heating of church buildings coupled with poor ventilation. It is being made much worse in a substantial number of Dorset Churches by the use of unventilated portable gas heaters. Large amounts of water can be deposited directly onto plaster surfaces by condensation. This can trigger severe dissolution damage and the mobilisation of soluble salts. *(Schaeffer, 1928, passim.).* It is likely that condensation problems have been made much worse by the combination of changing patterns of use for churches and changes in the type and scale of heating systems. Such damage will probably not become apparent for some time to come, and has not been directly observed during this survey.

14.6.4.15 Dissolution and mobilisation

Lime is not easily soluble in water that has not been acidified, so that most sources of damp do not directly dissolve lime plasters to any significant degree. However, by no means all historic plasters were based on pure lime. *(See Chapter 4)* Undercoat plasters often contained a large proportion of unfired clay. Clay does not dissolve in water, but it is easily mobilised. Dampness is thus capable of completely removing clay based plasters. More commonly, dampness causes clay based plasters to swell and disrupt their internal structure. No currently active examples of dissolution or mobilisation were observed during the survey, but see note on snapshotting. *(See chapter 7.7.17)*

14.6.4.16 Frost

Commonly, but wrongly, thought to be a major source of damage to building materials, frost is only an issue when plaster and masonry become saturated. *(Holmes, S., and Wingate M., 1997, p.223., Watt, D.S., 1999, p.103.)* This could be an issue for interior plaster where internal surfaces are below exterior ground level, or where serious roof or rain water goods problems exist. Even outright holes in the roof are unlikely to rapidly trigger frost damage to internal plaster. Hillfield *(See photographic evidence, chapter 15, on CD.)* did have a severe roof leak at the time of the first survey visit, and though this had been fixed by the time of the second visit, it is likely to have existed for at least two winters. Even this long standing and severe problem does not seem to have caused any plaster damage. No currently active examples of frost damage were observed during the survey, but see note on snapshotting.

14.6.4.17 Biological growth

Dampness is an essential pre-requisite of all biological growth. Sufficient moisture can turn even inhospitable materials such as lime plaster in fertile media for many species of plants. A chain of plant development can be set up : bacteria live, die and decompose providing nutrients for slimes and molds; slimes and molds in turn facilitate the growth of lichens and mosses; as lichens and mosses grow, they develop root structures which actively disrupt the surface of most building materials. The soil trapped and created by lichens and mosses allows larger and more invasive plants to take root. Invasive plants such as wallflowers, valerian or ivy can seriously damage structure. All such plants depend on dampness to develop and prosper. No currently active examples of severe biological damage to internal plaster were observed during the survey, but see note on snapshotting. *(See chapter 7.7.17.)*

14.6.4.18 Sulphation

This is probably the single biggest factor affecting the decay of limestone used on the exterior of buildings. The details of the process are complex but the principle is simple : acid sulphur gasses react with limestone and cause chemical and physical decay *(Schaeffer, 1928, passim.)*. In theory, this decay can affect any material that contains calcium carbonate, and there is no question that lime mortar and plaster can be damaged. In practice, obvious sulphation damage to interior surfaces is very rare. This is probably because exterior damage is a complex inter-reaction of chemical and physical processes and the physical factors inside a building are different to those outside.

No examples of sulphation damage to plaster were observed during the survey, but see note on snapshotting.*(See chapter 7.7.17.)*

14.6.4.19 Soluble mineral salts

In this country almost all soils and sub-soils are permanently damp. *(See above : Rising damp 14.6.4.4)* This dampness derives from rain and underground water movement. This ground water is rarely clean. It contains significant quantities of soluble mineral salts *(Schaeffer, 1928, passim., English Heritage, 2003, p.95.)* This would not be a problem except that most building materials are both porous and permeable. Salty ground water is drawn into foundations and walls by the internal structure of the construction materials. Once water enters the wall foot, it is drawn higher by capillary attraction, until it evaporates through the face of the wall. This might do little damage to most materials if the water were clean. However, the dissolved mineral salts crystallise out, as the water they are dissolved in evaporates. This crystal growth creates very powerful expansion forces inside the pore structure of stone, brick or plaster and disrupts the structure of the material *(Price, C.A., 1996, pp. 7-9)* Numerous examples of salt damage to plaster have been observed during the survey and it is one of the most important reasons for loss of historic plaster.

Particularly severe damage was observed at Loders, Litton Cheyney, Long Bredy, Warmwell and Upwey. *(See photographic evidence, chapter 15, on CD.)*

14.6.4.20 Poor plaster adhesion to substrate

Most of the reasons for plaster loss discussed in this section have involved the use of poor materials or design compromises, but the nave at Loders shows an opposite problem. *(See photographic evidence, chapter 15, on CD.)* Here, ample funds to have allowed the production of a very smooth internal wall substrate, and as a consequence, there has been a considerable problem in getting plaster to adhere to the stone. The chemistry of adhesion is complex and beyond the scope of this project. Whatever the underlying chemistry, lime based plaster needs physical key to bond well to most stones. This can be surface roughness, or on a much larger scale, the edges and gaps in the wall surface. The smoother and better jointed are the stones, the poorer is the key of the plaster. This does not appear to be a common problem, and Loders is the only church in the survey where it has been observed.

14.6.4.21 Impact and abrasion

Compared with the complex issues discussed above, impact damage displays a refreshing simplicity.

Frequent small collisions between people, furniture and plaster, the vibration from slammed doors and ringing bells have all produced produced widespread damaged in Dorset churches. Perhaps the most severe damage was observed in the tower base at Puncknowle. *(See photographic evidence, chapter 15, on CD.)* But the apparent ease of diagnosis of impact damage carries a real risk of oversimplification. Most of the apparently impact damaged plaster noted by the survey was at low level. As has been discussed above, *(14.6.4.19)* damage to plaster from soluble mineral salts is common at low level. To what extent are both processes inter-reacting? Where two or more dynamic processes are inter-reacting to cause the decay of plaster it is rarely possible to decide the relative significance of each process by means of a snapshot survey *(See chapter 7.7.17).*

14.6.5 Physical and environmental reasons for plaster survival

14.6.5.1 Introduction

This section describes the main mechanisms that the survey has definitely shown to have promoted the likelihood of plaster survival.

14.6.5.2 Monuments

Despite the cautions noted in the discussion of reordering, *(See above, 14.6.3.5)* the survey produced clear evidence that monuments can hide and protect earlier plaster thus causing significant survivals. Cerne Abbas and Cranborne are good examples. *(See photographic evidence, chapter 15, on CD.)* Protection by monuments is not a major factor in the survival of plaster in Dorset churches, at least not on the scale that might be expected in many other English counties, because Dorset has never been particularly rich in large monuments.*(Esdaile, K.A, 1946, passim., Kemp, B., 1980, passim)*

14.6.5.3 Wainscot

As with monuments, wainscot provides a physical barrier that directly protects old plaster and hides it from the attentions of restorers. Winterbourne Steepleton, Winterbourne Tomson and Warmwell are both good examples where this has taken place. *(See photographic evidence, chapter 15, on CD.)* However, these are the only three examples discovered by the survey. Wainscot was probably very common in seventeenth and eighteenth century Dorset church interiors, but itself fell victim to the restorers zeal and thus failed to survive or protect the plaster behind it.

14.6.5.4 Cupboards

A unique reason for plaster survival was found at Fordington church (Dorchester). Here a large fitted cupboard appears to have been too heavy to have been moved during restoration, and so preserved the plaster behind it. This may not be wholly atypical of restorers' efforts throughout the rest of the county. For example the rather beautiful, but certainly not Ecclesiologically pure tower stair at Stratton survived an otherwise comprehensive restoration. However, such survivals would seem to be truly random, and very uncommon. Restoration appears to have usually followed the model illustrated by the photograph of Broadwindsor church. *(See chapter 3.6.2, Figure 16)*

14.6.5.5 Overskim

The extent to which early plaster has been protected and preserved by later overskimming is the greatest uncertainty presented by the survey results. Extensive evidence *(See chapter 12.)* of early plaster was observed at the edges of later plaster and tantalising glimpses of early plaster were observed through damaged areas of later plaster, but neither source provides compelling evidence for the extent of survival behind the bulk of overskim. Possible strategies for dealing with this issue are discussed in chapters 9 and 10. Until a means can be found to see behind overskim, the extent to which it has provided protection to early plaster must remain a mystery.

14.6.5.6 Ruination

Knowlton church *(See photographic evidence, chapter 15, on CD.)* displays evidence of plaster survival *because* it was abandoned and ruined. Had it been saved from ruin by a nineteenth century restoration, that same restoration might well have removed all the early plaster. Ruination represents the ultimate in non-intervention.... conservation by neglect. Of course, this does not mean that ruination is the most effective way to preserve plaster, since all the physical decay processes noted above continue to operate.

It is unfortunate that the survey found so few ruined churches from the selected sample in Dorset, since it would have been very interesting to have examined a meaningful sample of ruins to properly examine the effect of ruination on plaster survival. Of the five visited :

i Knowlton and Portland St. Andrew are unrepresentative because they have been conserved by the Ministry of Works, and this conservation process is almost certain to have affected the extent of plaster survival more significantly than natural ruination would have done. *(See above, 14.6.3.12.)*

ii North Poorton and Compton Abbas have been deliberately demolished save for their towers, and the extent of restoration to these is unclear.

iii Stanton St. Gabriel is too ruinous to have any surviving wall surfaces.

14.6.6 Summary

This section functions only as a general introduction to the factors influencing the loss and survival of church plaster. The whole field of building material decay is far too large to review thoroughly in the space available.

The project produced a large amount unrecorded observation. This does not mean that it was poorly observed, merely that it did not form an integral part of the field survey. Such data was not formally recorded because time and resource limitations meant that it could not be recorded to an acceptable minimum standard.

However, because no data on general decay mechanisms was recorded by the survey, this does not mean that it was not accurately observed. The discussions given in this chapter are all based in the informal observation taken during the field survey, and would all appear to be relevant in some degree to most of the churches include in the survey.

14.7 Ultran promotional data on non-contact ultra-sound

Ultran is the name of a commercial company, based in the United States, making all types of ultra-sound equipment.

Extended contact by telephone with their Director of Research, Dr. Bhardwaj, suggested that their equipment would be likely to produce excellent results in any search for overskimmed plaster. However there would be need for considerable preliminary calibration. This author was invited to visit Ultran and develop the equipment, but there was not, and appears to be no funding available for extending the project in this way.

Ultran's general data on their non-contact system is attached below :

the ultran group

Non-Contact Ultrasound
CONCRETE, HIGHWAY, BRIDGES,
AIR STRIPS ANALYSIS

Application Note AN-305-4

Ultran iPass™ Ultrasonic System

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www.ultrangroup.com

Introduction

Contact or water immersion ultrasound provides significant information about materials quality and properties. However it cannot be applied to the early stages of materials formation, for instance when they are tacky or fragile. It is also not reliable for materials that are porous, liquid sensitive, or when any type of contact with a material is cumbersome. The Non-Contact Ultrasound (NCU) mode is highly desirable for concrete applications.

Ultran has been working to create NCU since 1978, however, the real breakthrough happened in 1997. That is when we succeeded in creating piezoelectric transducers characterized by phenomenal efficiency in air and other gases from ~50 kHz to >5.0 MHz. Complementing the NCU transducers are Ultran's equally novel ultrasonic systems and signal processing. Our iPass™ ultrasonic system is customer-friendly. iPass™ understands the significance of materials testing and analysis, including the speeds required for various applications.

iPass™ single and multi-channel systems have been fully tested for on-line and QC analysis of cements, aggregate, reinforced concrete cement (RCC), asphalt, fiber reinforced concretes, and new concrete composites.

Problems Solved by iPass™

Ultrasound transmission through concretes as thick as 1 m.

In-process concrete setting behavior

High resolution detection of overt defects and cracks

Applicable to very thick and attenuative materials

Density/porosity, texture, and mechanical properties

Through transmission and same side testing

Near theoretical PRFs for extremely high testing speeds

Brief Description of iPASS™

NCU Transducers

Arguably, the highest efficiency devices: approaching those of conventional contact transducers. Frequencies from <50 kHz to >5.0 MHz. Active dimensions, <1.0 mm to >500mm. Beam geometry, planar, point, parabolic, and compound. Robust construction and lightweight.

Ultrasonic and signal manipulation system

inPulse: 50-400 volt half and full square wave digital burst pulser. Frequency range, <50 kHz to 2 MHz, 5 MHz (option), adjustable pulse width, # of pulses, PRF, & voltage, automatic overload & over-temperature shut down, fully programmable & computer controlled.

Nurve: Single or multi-channel multiplexing receiver amplifier with peak detection, frequency range, <30 kHz to 2 MHz, true gain, ~80 dB, attenuator for high level signals: 15 dB, >100 dB dynamic range, LPF, 0.2, 0.8, 1.0, and 2.0 MHz; HPF, 40, 200, 400, and 800 kHz, trigger source, internal and external.

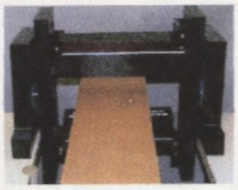
Cortex: NCU Logic System. Processor, ultra-fast latest Intel P4, hyper-threading technology, memory: 2 Gb, motion synchronized acquisition, via Synapse, ADC sampling rate, 50 kHz to 2 GHz, resolution: 8 to 12 bit, industrial grade housing.

iniView: Post image processing software suitable for NCU materials. Cross-sectional profiles for quantitative analysis. Absolute transmittance and reflectance measurements. Palette selection for easy accept-reject limits. Virtual elimination of edge effects. Parametric correlation of acoustic vs. material characteristics. Statistical quality control. Numerous features for detailed localized region analysis.

Transducer mounting mechanism: Customer selected vertical/horizontal acoustic bench, single or multi-transducer scanning systems.

Display modes: Images, RF A-scans, continuously rolling single or multi-channel linear scans.

iPass™ Ultrasonic System



the ultran group

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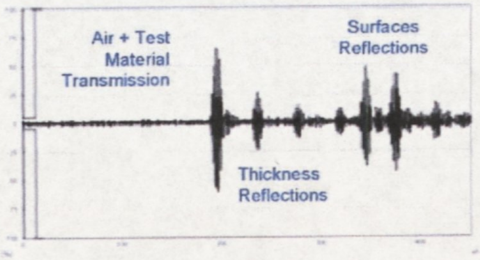
Non-Contact Ultrasound Techniques

Direct Transmission



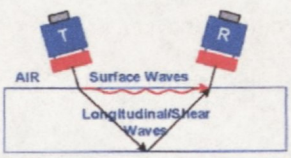
Defect, crack, delamination detection

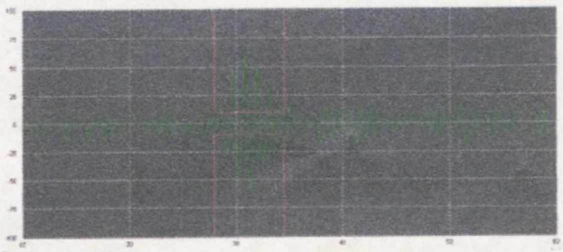
Velocity, time-of-flight, thickness measurements

Oblique incidence & refraction for shear wave and anisotropy measurements

Transmittance measurement

Same Side Transmitter-Receiver – Pitch-Catch

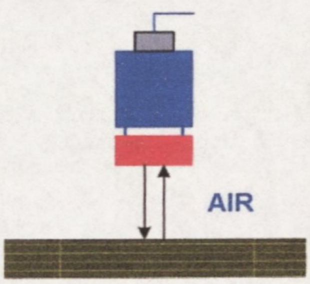




Defect, delamination, corrosion detection

Location of discontinuities

Single Transducer – Pulse-Echo



Surface profiling

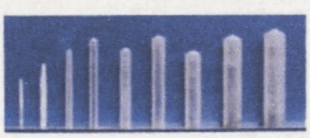
Surface acoustic analysis

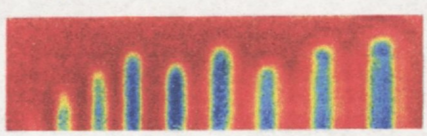
Reflectance measurements

Depth measurement

Object identification

Quantitative Detectability Example





Detection of side drilled holes (varying from 0.5 to 6.3 mm) in 10 mm PMMA with direct NCU transmission (1.0 MHz)

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Observations and case studies by direct transmission and same side NCU imaging

All images are raw,
without special or post-signal processing.
No signal averaging was used in most cases.

Aggregate cement matrix and asphalt concrete – figures 1 and 4

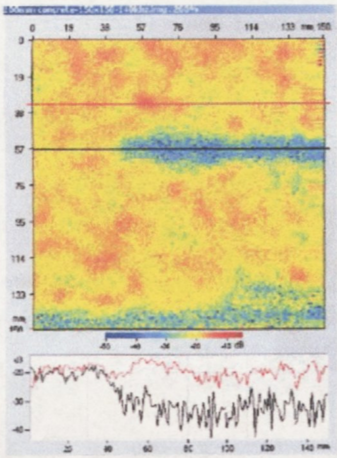

Fig. 1. 100 mm thick concrete with 20 mm side drilled cylindrical hole. 140 kHz

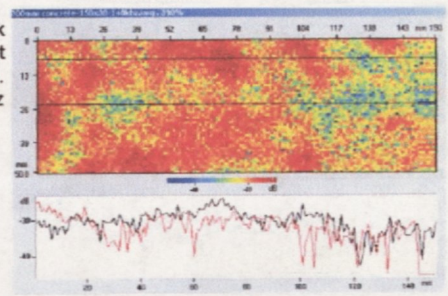

Fig. 2. 200 mm thick concrete with slight variations in texture. 140 kHz

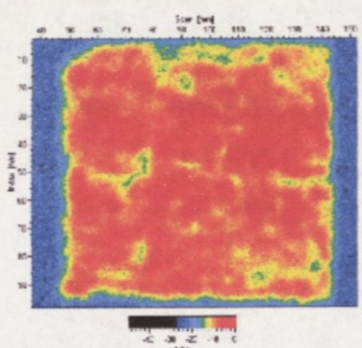

Fig. 3. 80 mm thick concrete of homogenous mix. 140 kHz

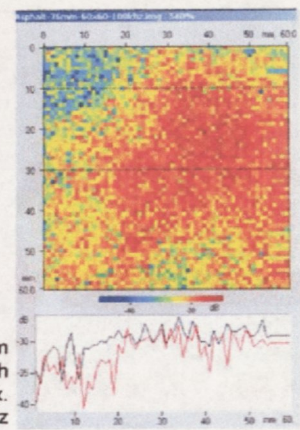

Fig. 4. 76 mm asphalt concrete with uneven mix. 100 kHz

More NCU of concrete

In direct transmission mode, NCU transmission has been observed through concrete as thick as 1 m. From the same side (pitch catch), long distance bulk and surface waves have been observed by NCU. Please contact The Ultran Group for more information.

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Conclusions

The Ultran iPass™ ultrasonic system is characterized by a wide range of frequencies from <50 kHz to 5.0 MHz. This makes it possible to apply non-contact ultrasound for concrete evaluation. Typical applications include analysis of cements, aggregate, reinforced concrete cement (RCC), asphalt, fiber reinforced concretes, and new concrete composites. iPass™ is a powerful tool for materials process analysis and QC, directly saving you cost, energy, and materials, besides assuring the quality and reliability of your materials.

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What Ultran Provides

We supply complete NCU systems and laboratories suitable for customers' needs. These also include specifically designed transducer libraries so that you do not have to waste time in R&D.

On-line NCU systems configured to customers' applications and environment of testing.

Science and technology transfer targeted to your needs. We take the responsibility of hands-on training of our customers.

We maintain several ultrasound materials analytical laboratories. We are fully equipped to provide feasibility, in-depth analysis, and R&D.

14.8. The authors' practical conservation experience

Abbreviations :
CCC- Churches Conservation Trust
EH- English Heritage
HM- Her Majesty the Queen
NT- National Trust

Reports

These varied greatly in length and subtlety, the longest being around 5,000 words, the shortest around 250. Few of the reports are still in the authors' possession, and it is not known whether they are retained by the client. The list below gives the location, date, and nature of technical issue, where these are known.

Abergavenny 3.92, repair of monuments
Acton Burnell, Shropshire 10.86 repair of monuments.
Arlington Church, Devon, NT, 10.92 repair of monument
Ashdon Essex, 9.87, flint repairs
Binham Priory, Norfolk, SPAB, 1.90, ferramenta in west window
Bere Ferrers church, Devon, 10.93, collapsed plaster
Bradley Manor Chapel, Devon, NT, plasterwork
Castle Ashby, Northamptonshire, 89, terra-cotta repair
Caunton, Notts. 94, salt damage.
Coltishall, Norfolk, 11.88, Easter sepulchre
Chadshunt, Warwickshire, 11.88, repair to monuments
Croombe Dabitot, Warwickshire, CCC, 88, monuments
Dormer memorial, Warwickshire, 88, repair of monument
Durham cathedral, 92, SPAB, use of consolidants
East Peckham, Kent, CCC, 94, stonework repairs
East Raynham, Norfolk, 88, CCC, condition of stone and plaster
Evercreech, Somerset, 93, condition of preaching cross
Exning church, Suffolk, 87, condition of heart tomb
Gloucester, St Nicholas church, CCC, 92, condition of monuments
Hampton Poyle, Oxfordshire, CCC, 92, condition of Easter sepulchre
Hankridge Farm Somerset, 93, condition of plaster
Hardington Bamfylde church, Wiltshire, CCC, 91, condition of monument
Holme Lacey church, Worcestershire, CCC, 93, condition of monuments
Honeychurch church, Devon, 86, condition of plaster work
Hoxne, Suffolk, 88, condition of monument
Kedleston church, Derbyshire, 91, condition of floor and monuments
Langton Matravers, Leeson House, 88, condition of wooden panelling
Lavenham church, Suffolk, 88, condition of limewash
Lincoln Cathedral, 86, SPAB, repairs to west front
Luffincote church, Devon, CCC, 90, condition of masonry
Marystowe church, Devon, 91, condition of monument
Molland church, Devon, 86, condition of monument
Monks Eleigh church, Suffolk, 87, condition of porch stonework
Newton Abbot, Devon, town house, 88, condition of moulded plaster ceiling
Newton Abbot, Devon, St Mary, 88, condition of plaster and internal fittings
North Stoke, Sussex, CCC, 93, condition of plaster and external pointing
Old Dilton church, Wiltshire, CCC, 90, condition of plaster and monuments

Packwood House, Warwickshire, 87, condition of plunge pool
Parracombe Old Church, Devon, CCC, 94, condition of monument
Plymtree church, Devon, 89, condition of tower niche
Plymouth, Resolution Fort, Devon, 93, re-pointing and capping of ruin
Richards Castle, Shropshire, CCC, 86, condition of internal pointing and plaster
Roadwater, Devon, cob house, 91, condition of collapsed cob walls
Shorncote, Gloucestershire, CCC, 88, condition of painted plaster
Shrewsbury, Salop., St Mary's Abbey, condition of monuments
Soham, Cambridgeshire, CCC, 87, condition of monument
Strensham church, Worcestershire, CCC, 91, repair of monuments
Tirley church, Glos, 93, repair of monuments
Winkburn church, Notts., 94, repair of monuments

Contracts

These ranged form below £100 to more than £100, 000 in value. This list is incomplete, especially in the years before 1987.

Albermarle Row, Bristol, ?83, repair of plaque
Arlington Glebe House, NT, 92, repair of fireplaces
Avon Dasset, CCC, 11.92, repair of Easter sepulchre
Axminster church, 9.85, repair of parapet gargoyles
Beaminster parish room, 84, repair of plaque
Boxford Church, Suffolk, 88-91, south porch repair
Bridport Chantry, Devon, Vivat Trust, 87-88 and 92, stone and plaster repairs
Brighton Pavillion, Sussex, 84, repairs to stonework
Bristol Cathedral, 87-94, repair of monuments
Bristol Redmaids School, 85, cleaning and repair of fireplace
Bristol St. Stephens church, 87-88 and 92, repair of monuments
Bristol Temple Meads railway station, 83, masonry repairs to Brunel's façade
Budleigh Salterton, Devon, 83, window tracery repairs
Bury St Edmunds, St Mary's Church, 86, repair of niches on west front
Collaton Raleigh church, HM, 87, repair of sgraffito plaster
Chedworth Roman Villa, Glos., NT, 86-89, masonry and mosaic repairs
Claydon church, Suffolk, CCC, 87, stonework repairs
Compton Abbas church, Dorset, SPAB, 86, pointing
Croombe Dabitot, Warwickshire, CCC, 4.90, recovery of stolen font and statues
Deerhurst church, Glos., 8.92, repair of Saxon angel
Dundry church, Somerset, 83, window tracery repairs
Duxford church, Cambs., CCC, 89-90, masonry repairs
Fitzhead, Arse Cotts cottage, Somerset, 87-88, plaster and wall painting repairs
Globe Theatre, London, 94, fire testing of lime mortar
Gloucester, St Nicholas church, CCC, 86, repair of monuments
Hertford, drinking fountain, 85, stonework repairs
Inglesham church, CCC, 87, conservation of wall plaster and paintings
Longford, Talbot Chapel, Shropshire, CCC, 85-88, repair of plaster and monument
Llancaiach Fawr, Glamorgan, 85-86, masonry repairs
Marshfield, town house, Glos. 85, fireplace repair
Merton, Great Potherage, Devon, 88, repair of painted ceiling
Moulton St Mary, Norfolk, CCC, 85, repair of monument
Nether Cerne church, Dorset, CCC, 90, repair of tower parapet
Oborne church, Dorset, CCC, 89, repair of window tracery

Packwood House, Warwickshire, NT, 87, repair of sundial pediment
Paignton Art College, 90, repair of sgraffito plaster
Parham House, Sussex, NT, 85, repair of masonry
Pendennis Castle, Cornwall, EH, 91, plaster repairs
Pitstone, Bedfordshire, CCC, 92, repair of font
Portsmouth Cathedral, 91-92, repair of monuments
Rous Lench church, Worcestershire, 93-94, repair of monuments
Spetchley church, Worcestershire, CCC, 87-89, repair of monuments
Spetchley church, Worcestershire, CCC, 88-91, repair of chancel
Stanton St John, Oxfordshire, 92, repair of fireplace
Taunton Castle, Somerset, 87, repair of stone coat of arms
Tetbury, St Saviour's, Glos., 88, repair of stone reredos
Thelnetham church, Suffolk, 86 and 89, repair of window tracery
Tewkesbury Abbey, Glos., 89, repair of monument
Tewkesbury Abbey, Glos., 91-92, repair of deSpencer and deBrien tombs
Tewkesbury Abbey, Glos., 93, repair of tomb canopy
Thurlbear church, Somerset, 90, repair of plaster
Torbryan church, Devon, CCC, 87, 88 and 90, repairs to sculpture, windows and structure
Torre Abbey, Torquay, Devon, 88, repairs to plaster in the ruins
Twyning church, Glos., 00, repair of monument
Upton Cresset church, Salop., CCC, 86-87, re-plastering of interior and repairs to windows
West Hanney church, Oxfordshire, 87, repair of window tracery
Winterbourne Gunner, Wiltshire, 89 and 93, re-rendering of tower
Wolborough, Newton Abbot, Devon, 93, repair of monument
Woolveton Manor, Dorset, 86, re-pointing
Wroxeter church, Salop., CCC, 87, repair of monuments

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